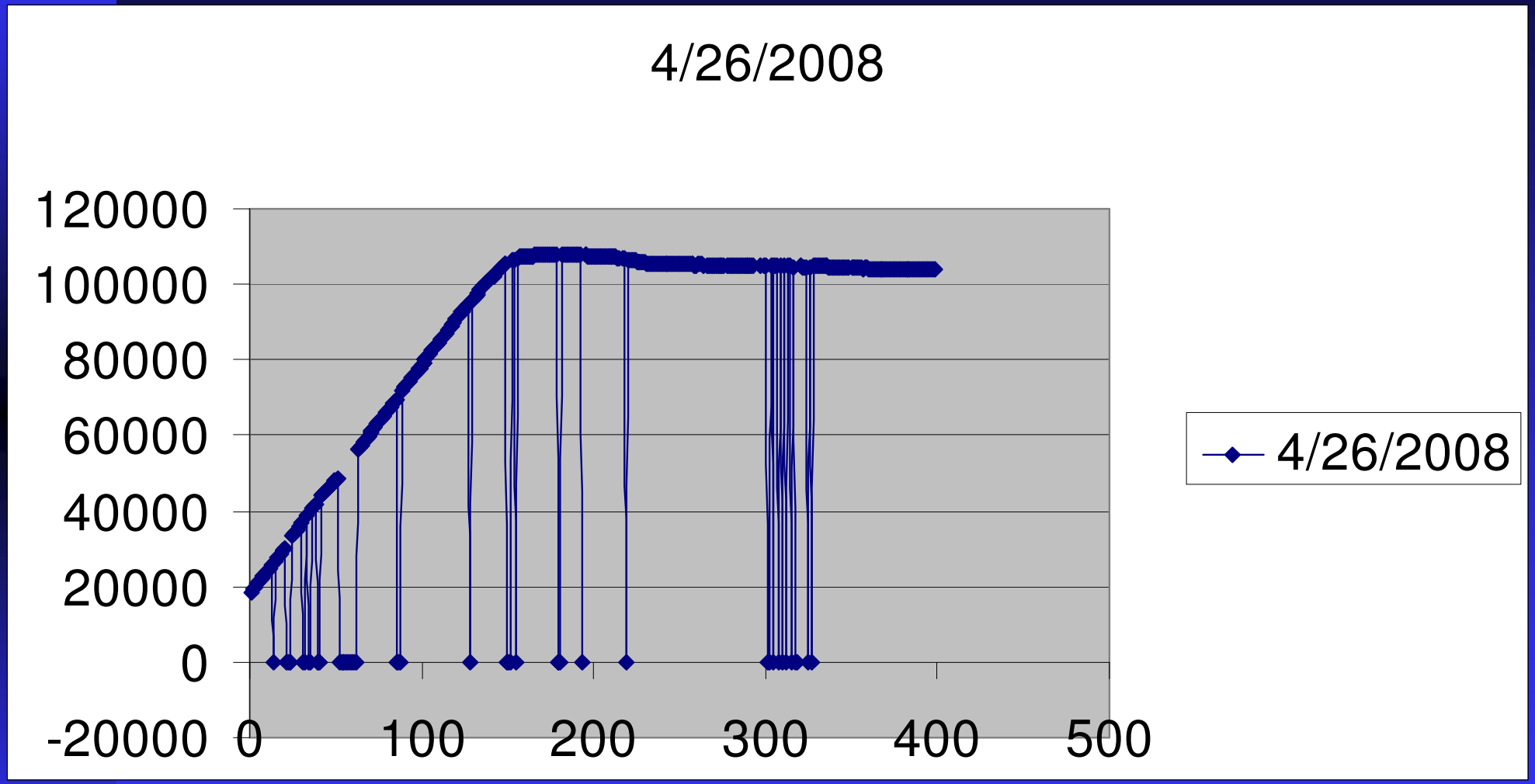
Long Duration Flight Techniques

Continuous Vent Hole – Latex balloons

Conduit Pipe with 1/16” hole in end cap

Continuous Vent Hole – Latex balloons



Ascent Rate – 17 hour flight with 1500 gm latex balloon

Continuous Vent Hole – Latex balloons

RESULTS:

-1/16" hole reaching peak altitude 1 hour before sunset:

- ***17.5 hour flight floating between 98,000 to 107,000 feet***

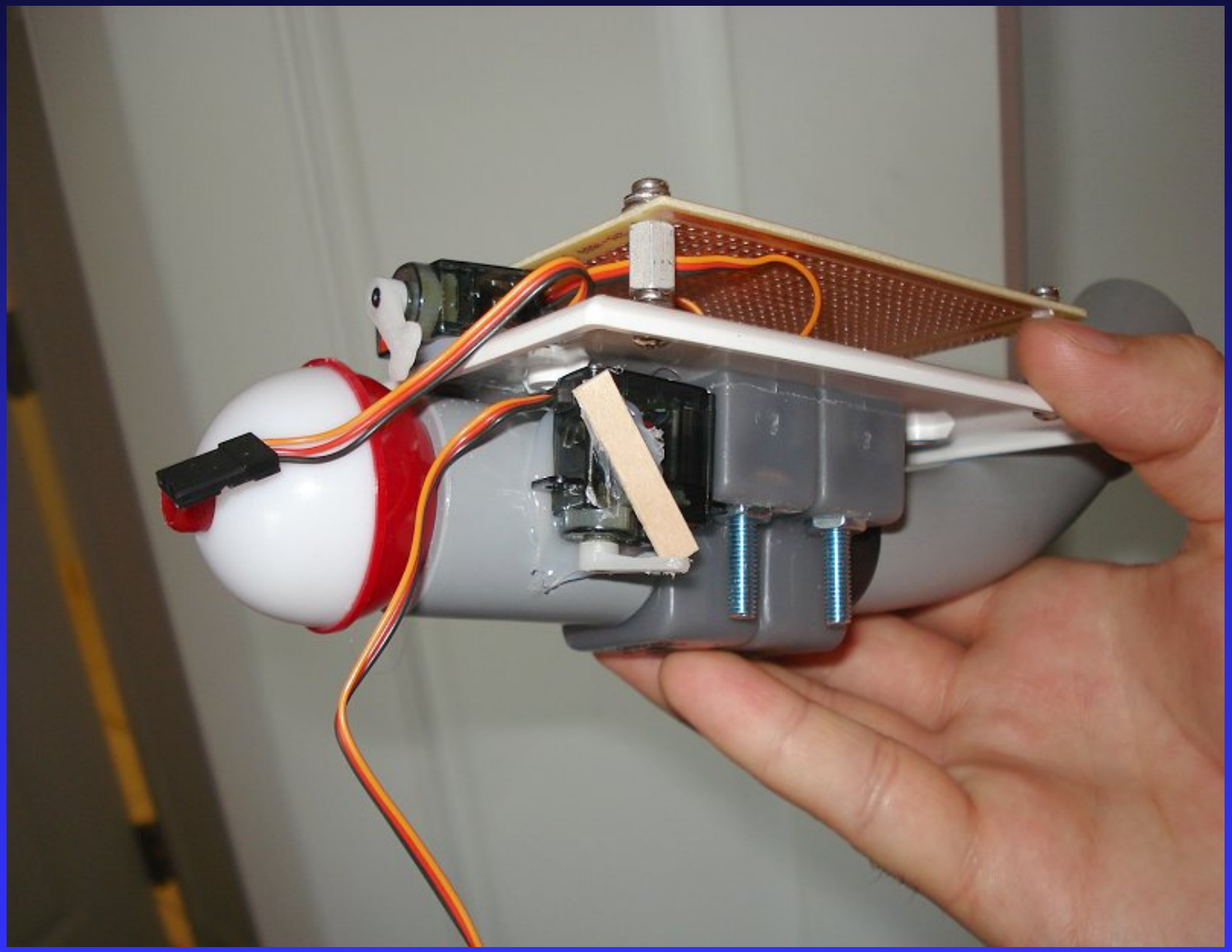
-1/16" hole launched mid-day for Field Day:

- ***Normal flight but achieved higher than usual 115,000 feet***

- TWO 1/16" holes:

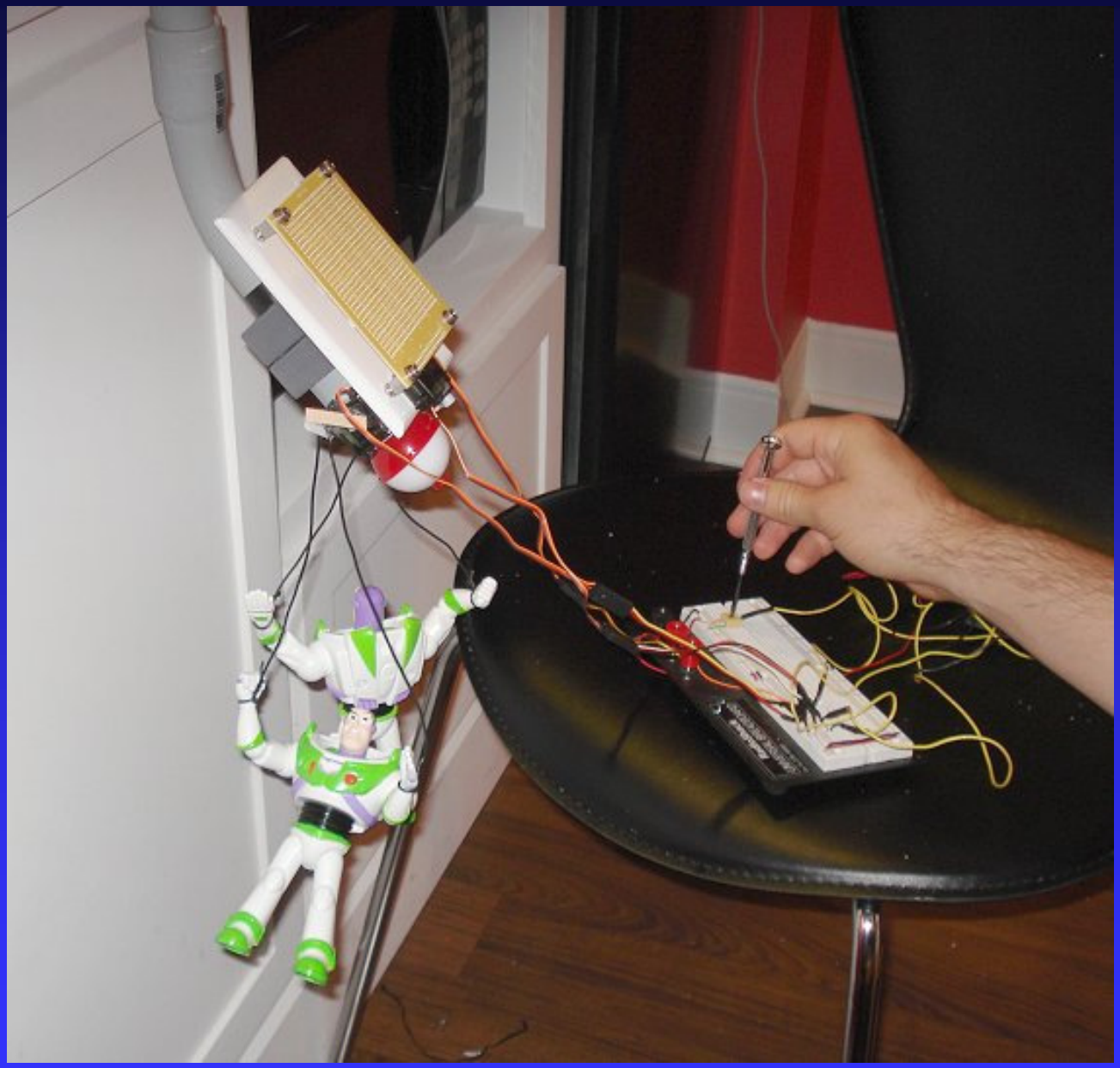
- ***Flight leveled off at 23,000 feet and slowly descended landing with balloon intact***

Vent Valve and Ballaster – Latex balloons



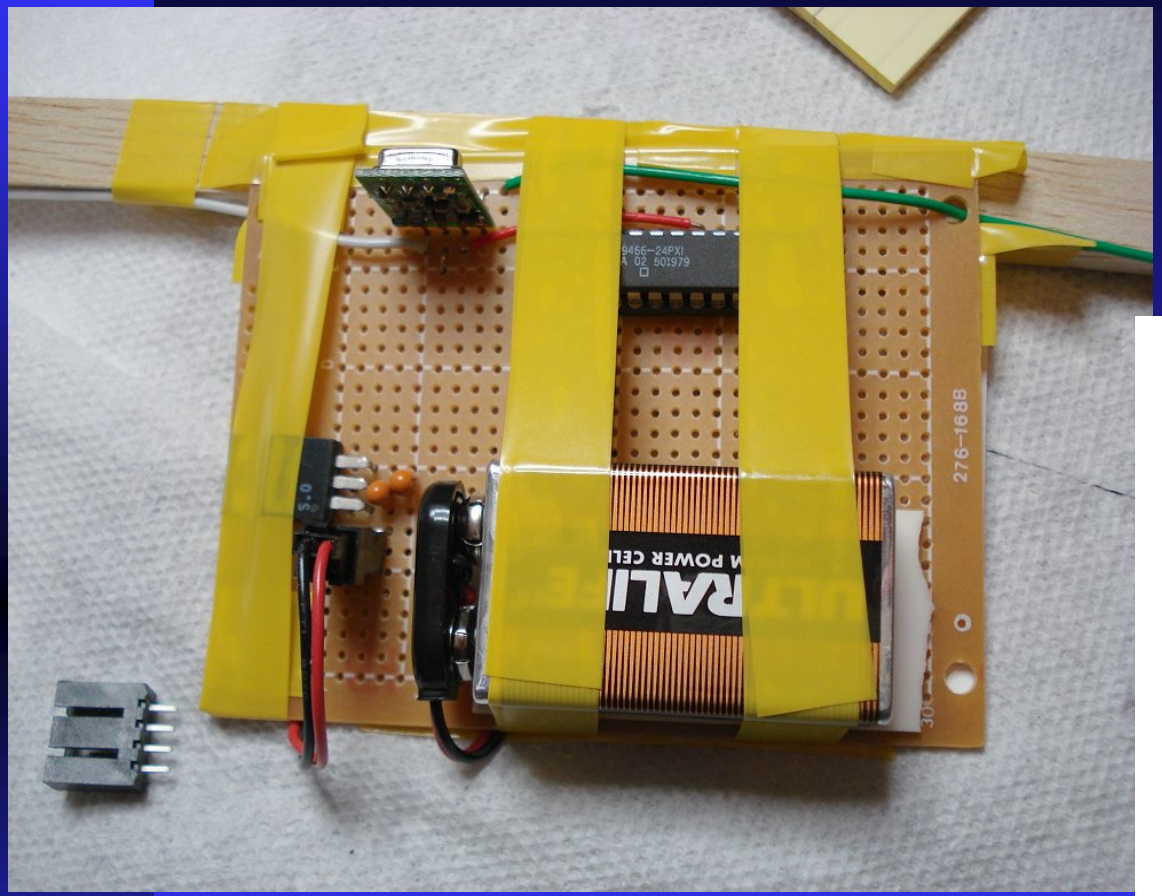
Using items from Lowes, Autozone and Walmart

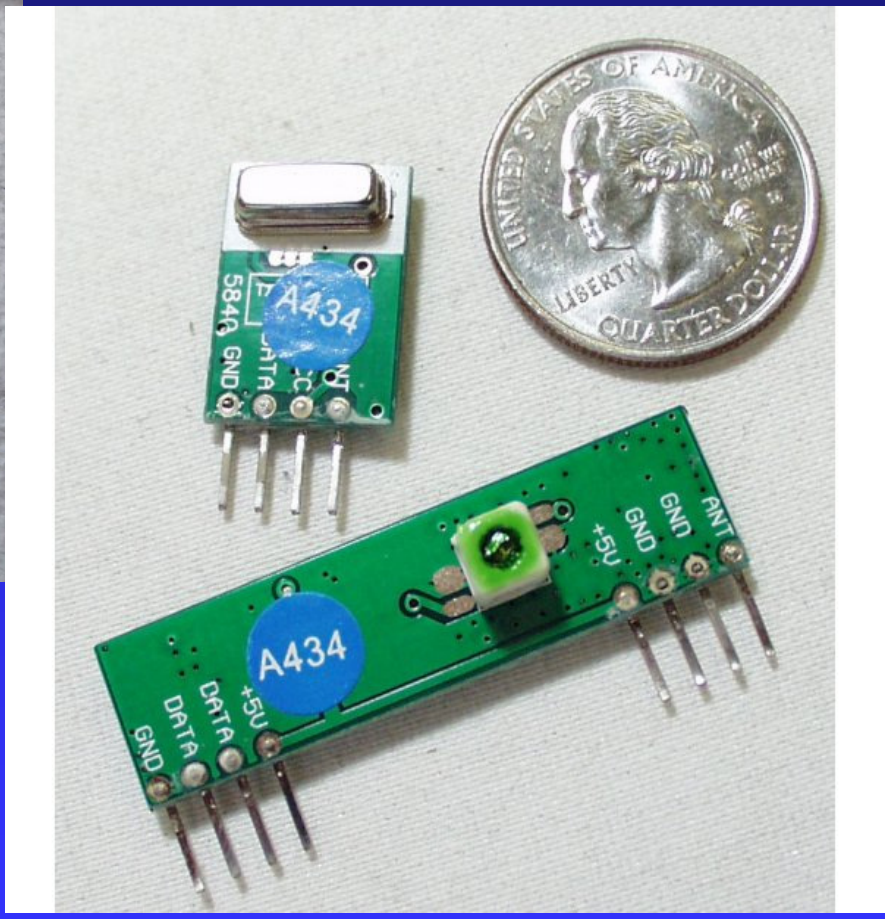
Vent Valve and Ballaster – Latex balloons



Using items from Lowes, Autozone and Walmart

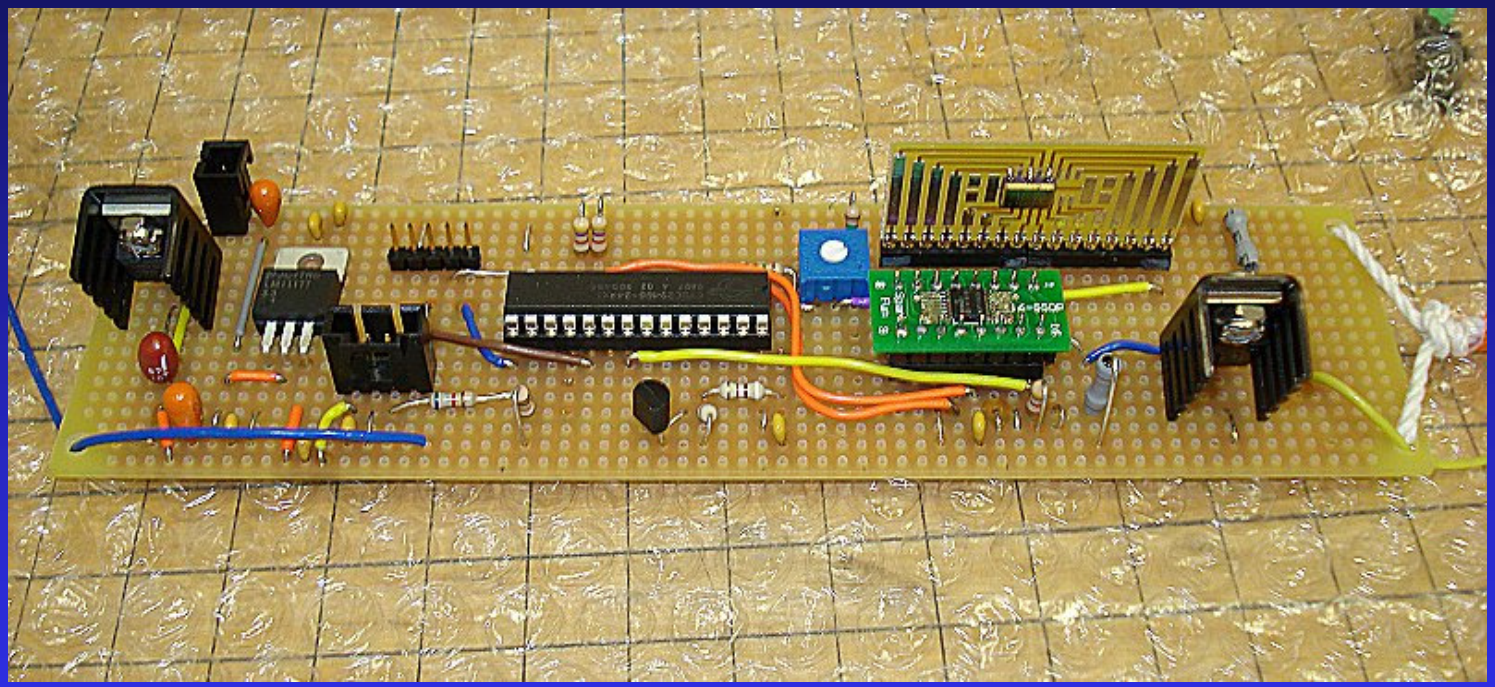
WB8ELK UHF Telemetry Xmtr





10 mW – RTTY and audio CW - AM

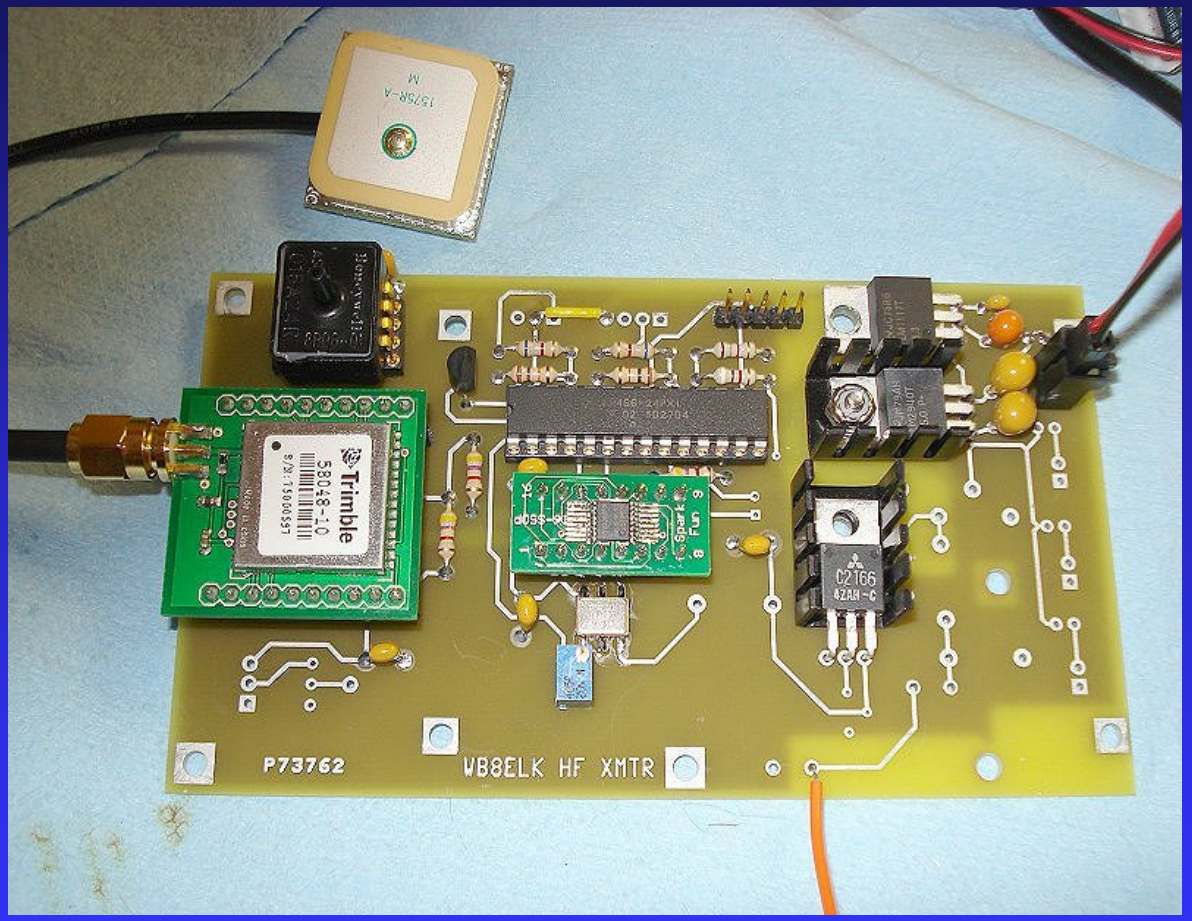
WB8ELK HF Telemetry Xmtr



1 W – RTTY, Hellscreiber and DominoEX

GPS data, temperature, pressure, voltage

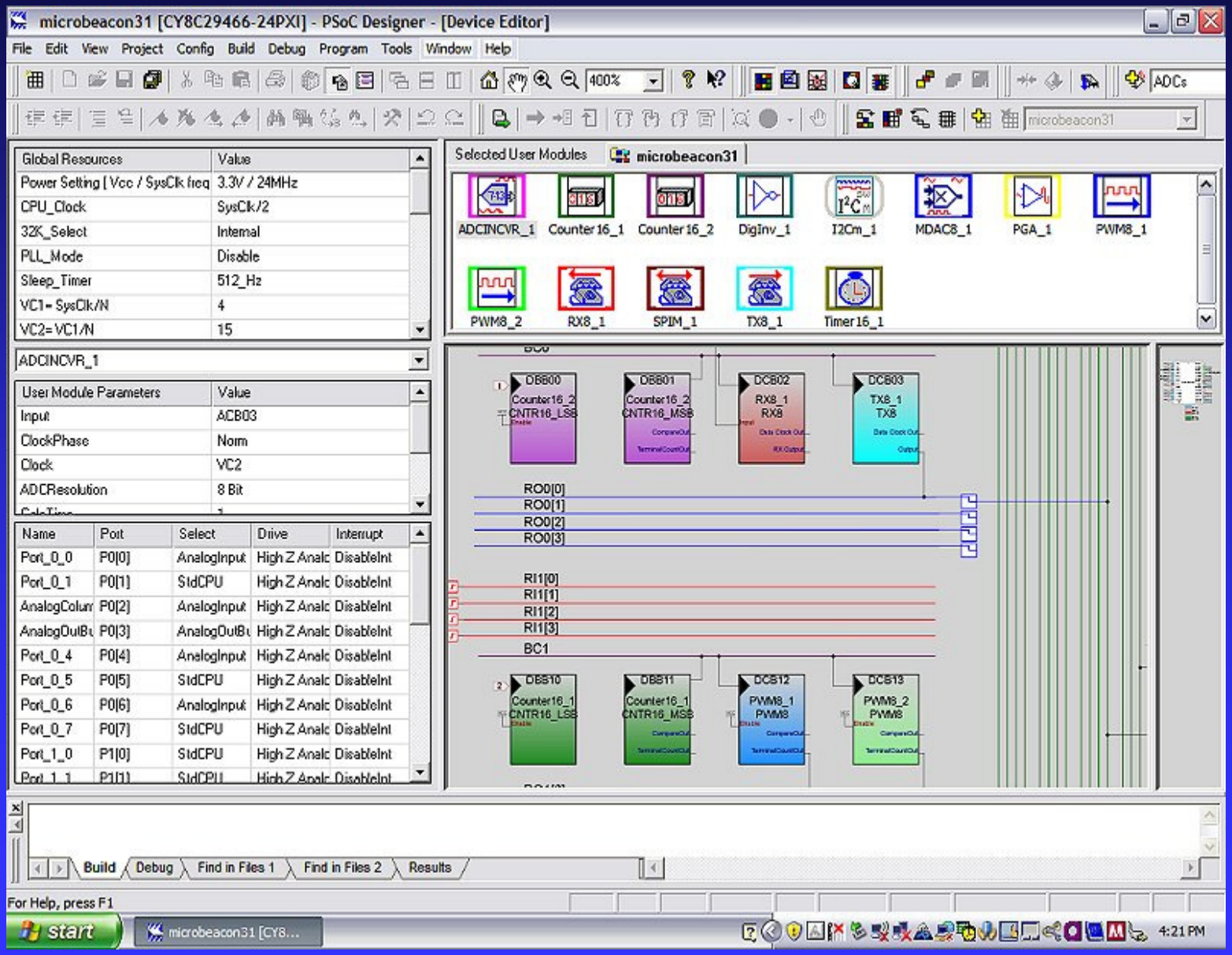
WB8ELK HF/VHF Telemetry Xmtr



1 W – RTTY, Hellscreiber and DominoEX

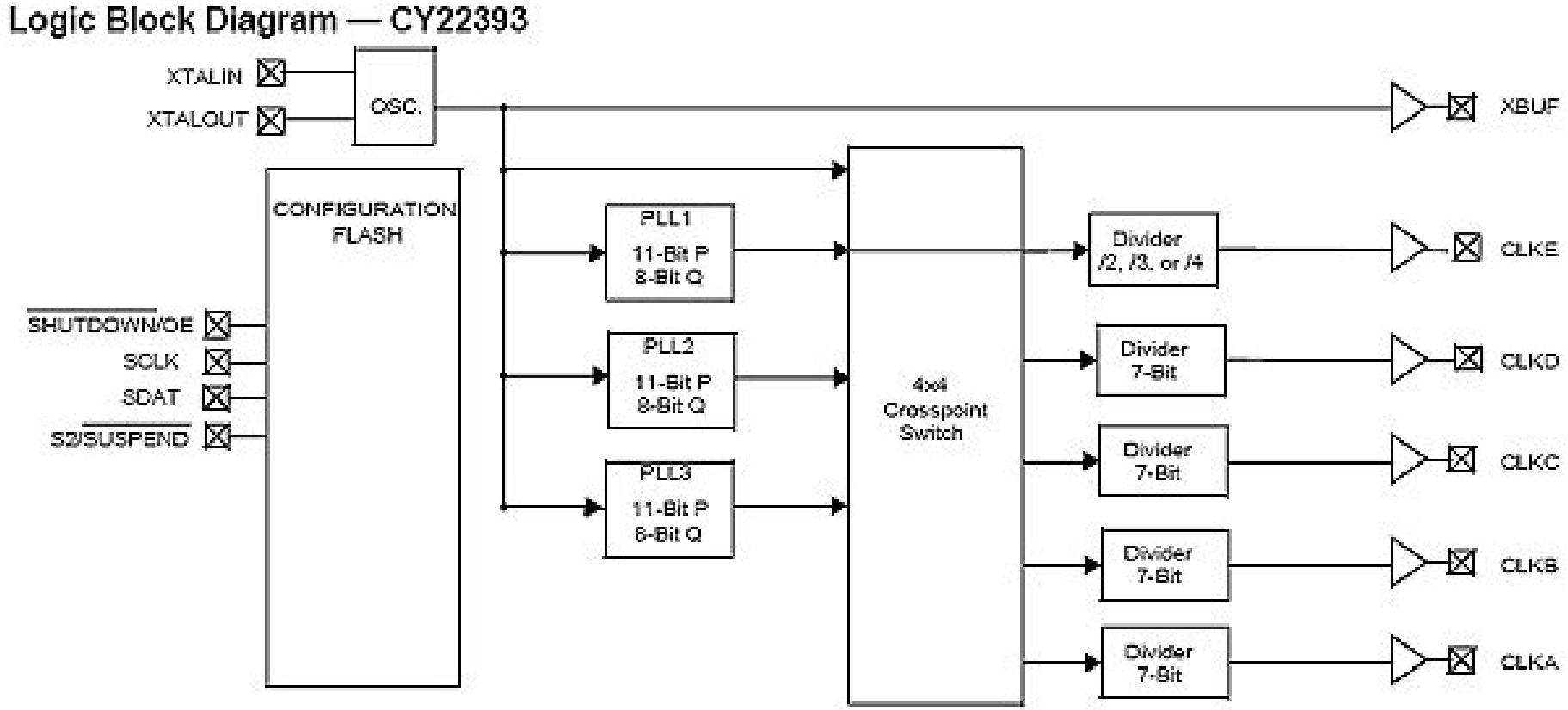
Final PC Board Version

Cypress PSoC Microcontroller



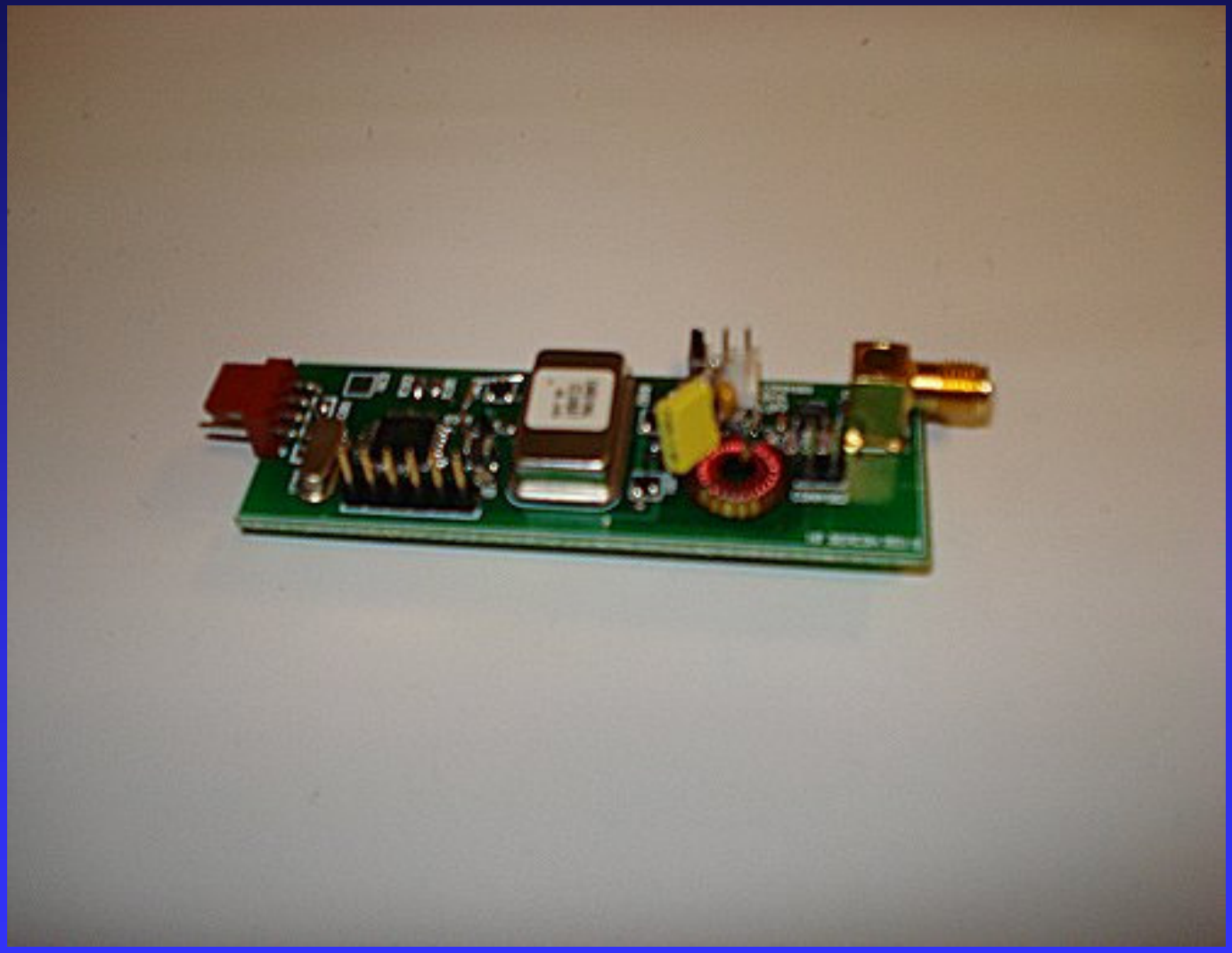
Mixed Signal – Analog and Digital Blocks

Cypress CY22393 clock chip



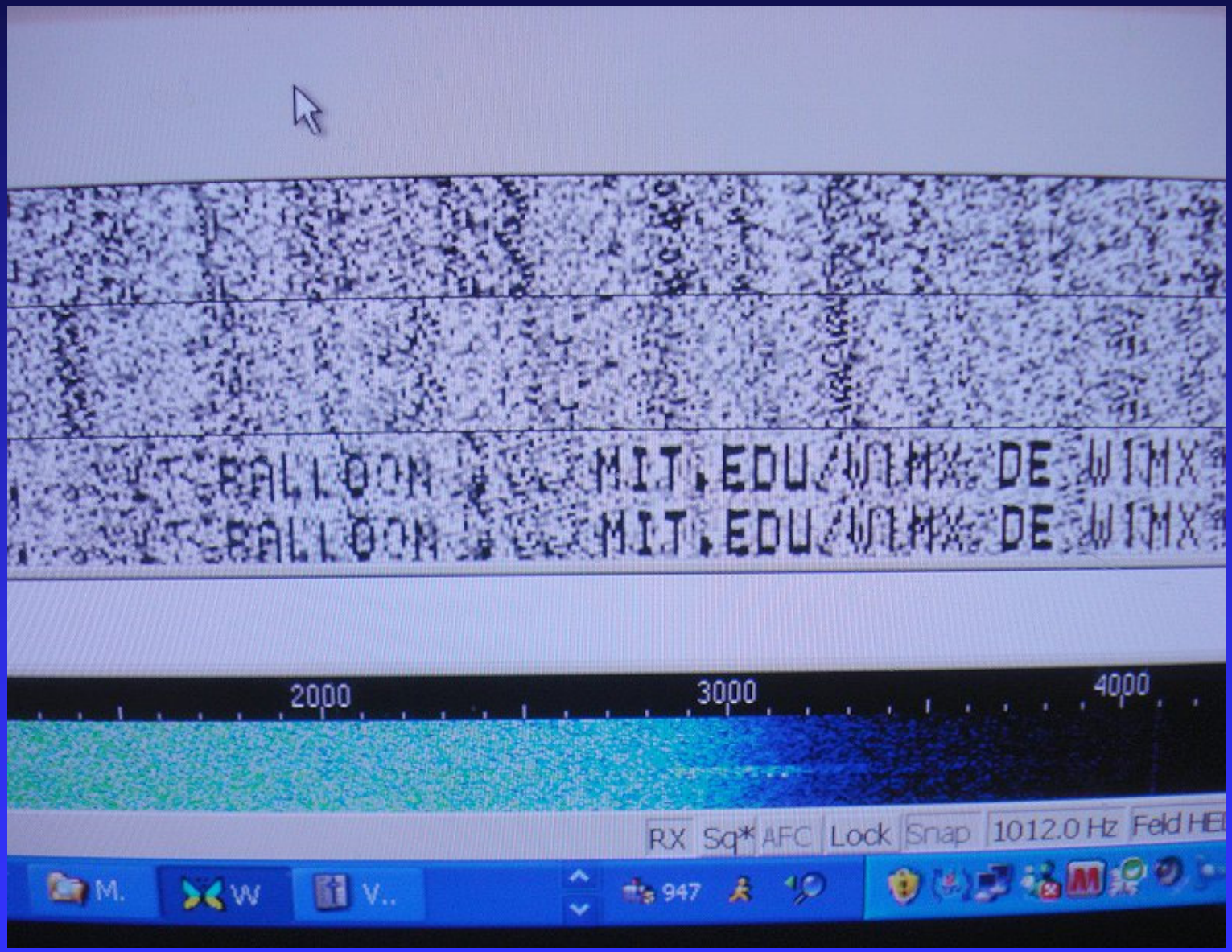
HF/VHF synthesized output – 10 mW

Hellscreiber Mode



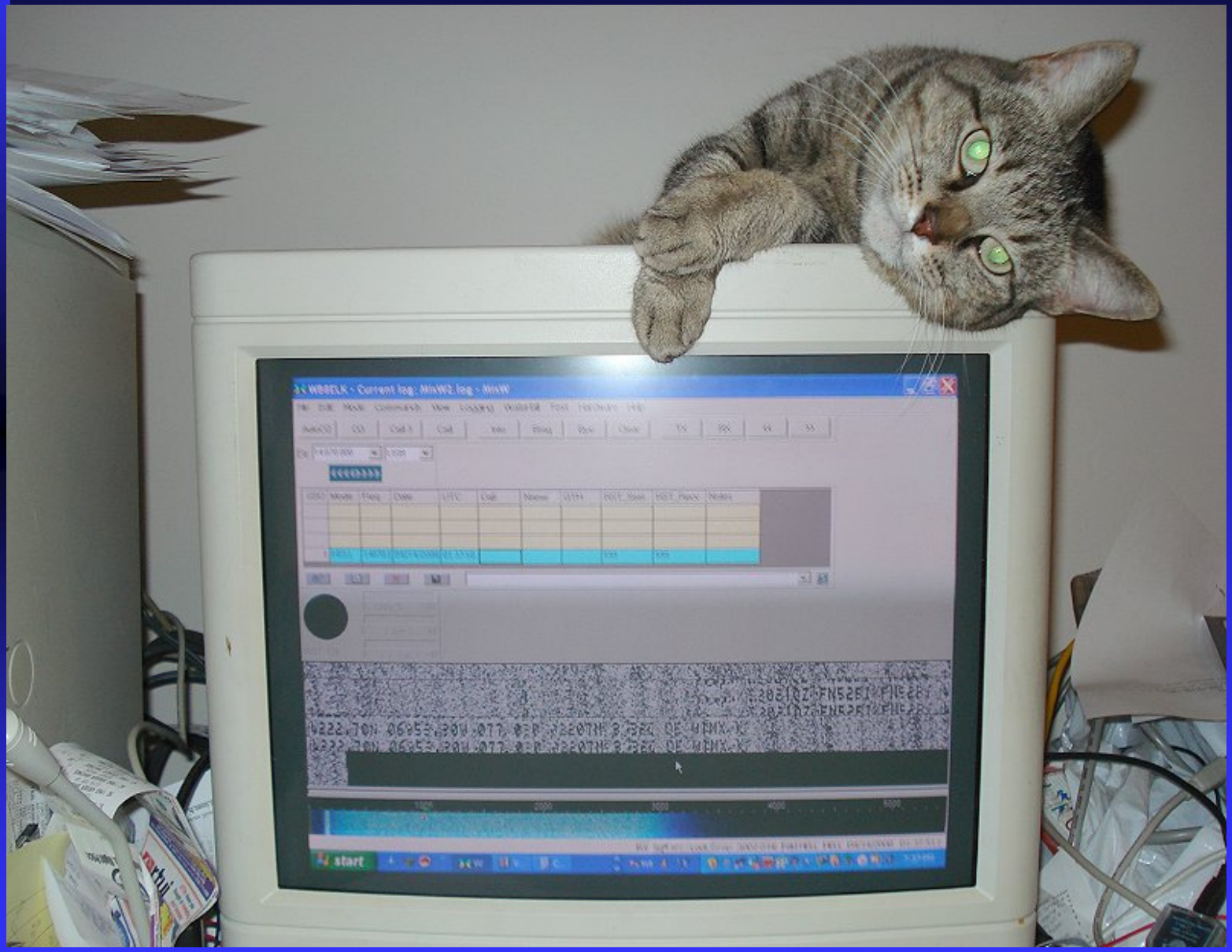
Ben Gelb's N1VF CW/Hellscreiber Xmtr

Hellscreiber Mode



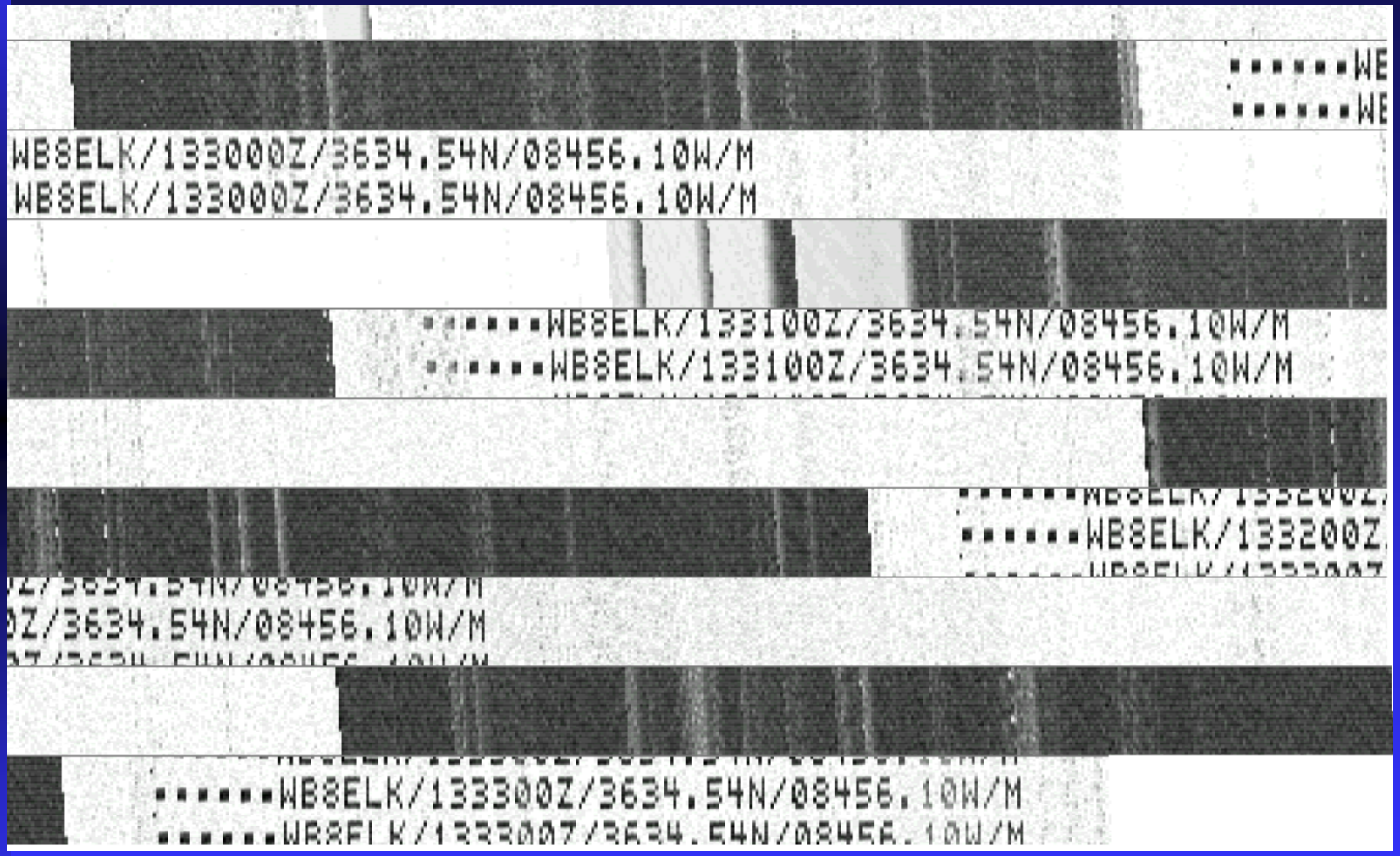
Hellscreiber reception of W1MX balloon

Hellscreiber Mode



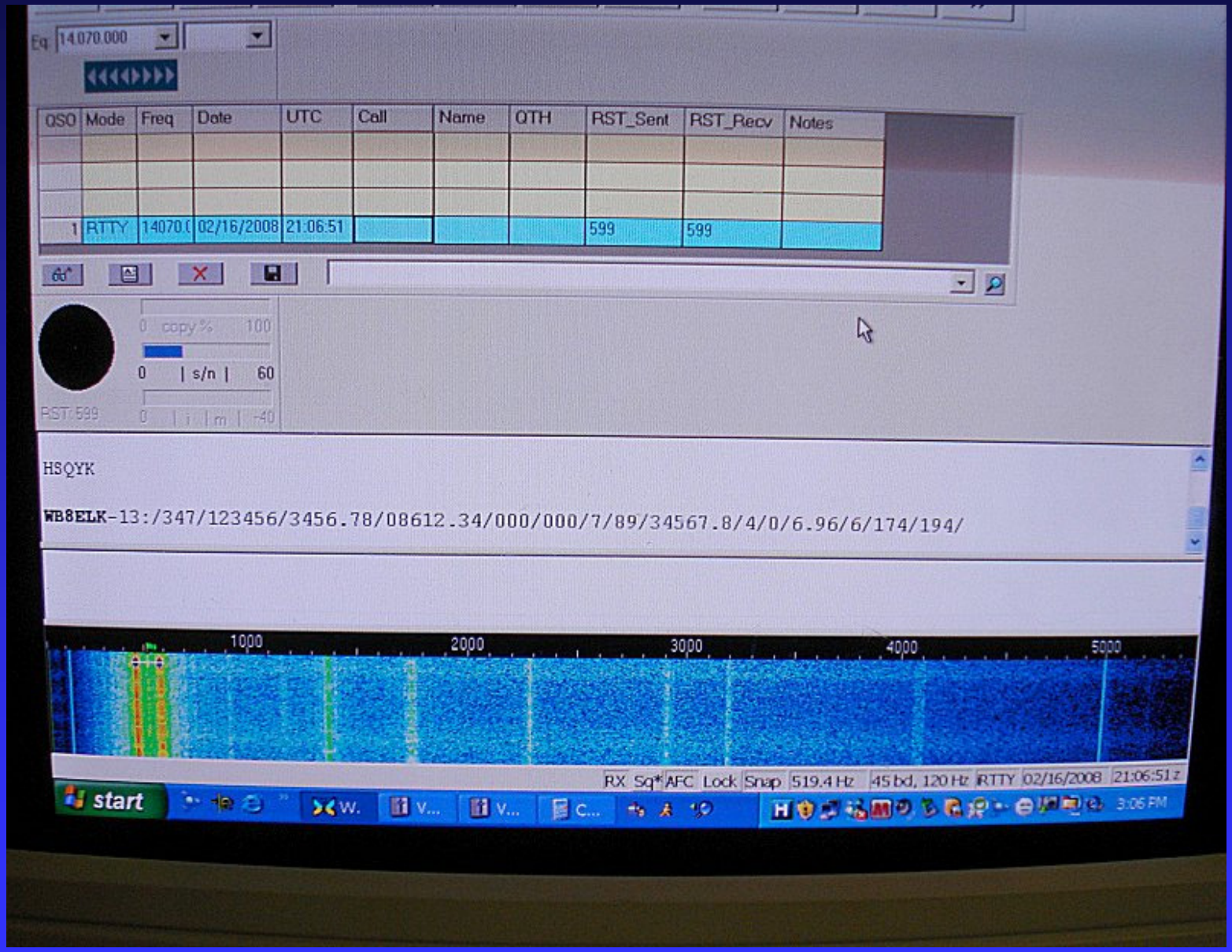
W1MX/balloon from 1400 miles distance

Hellscreiber Mode



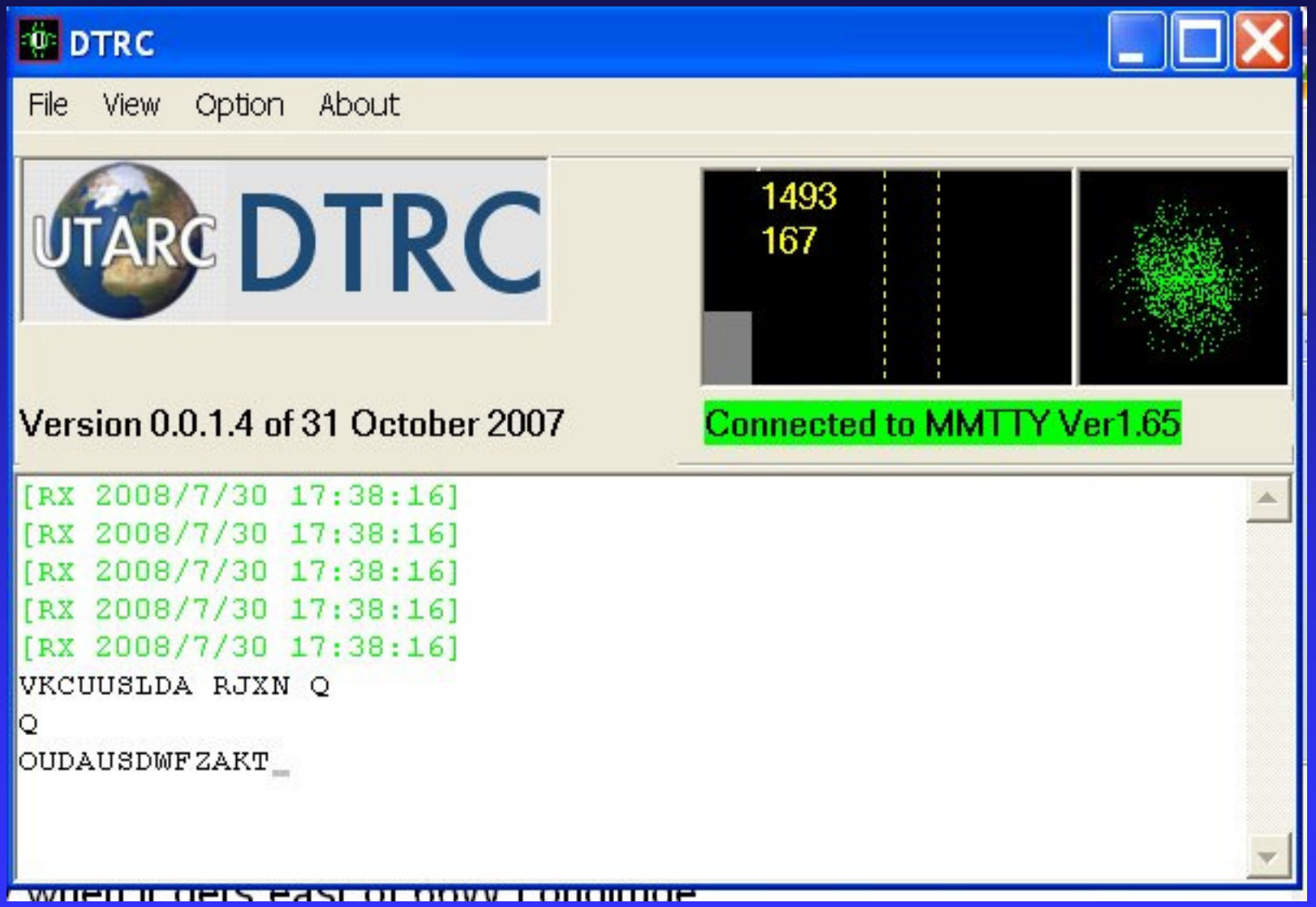
IZ8BLY Hell-Hell automated screenshots

RTTY Mode



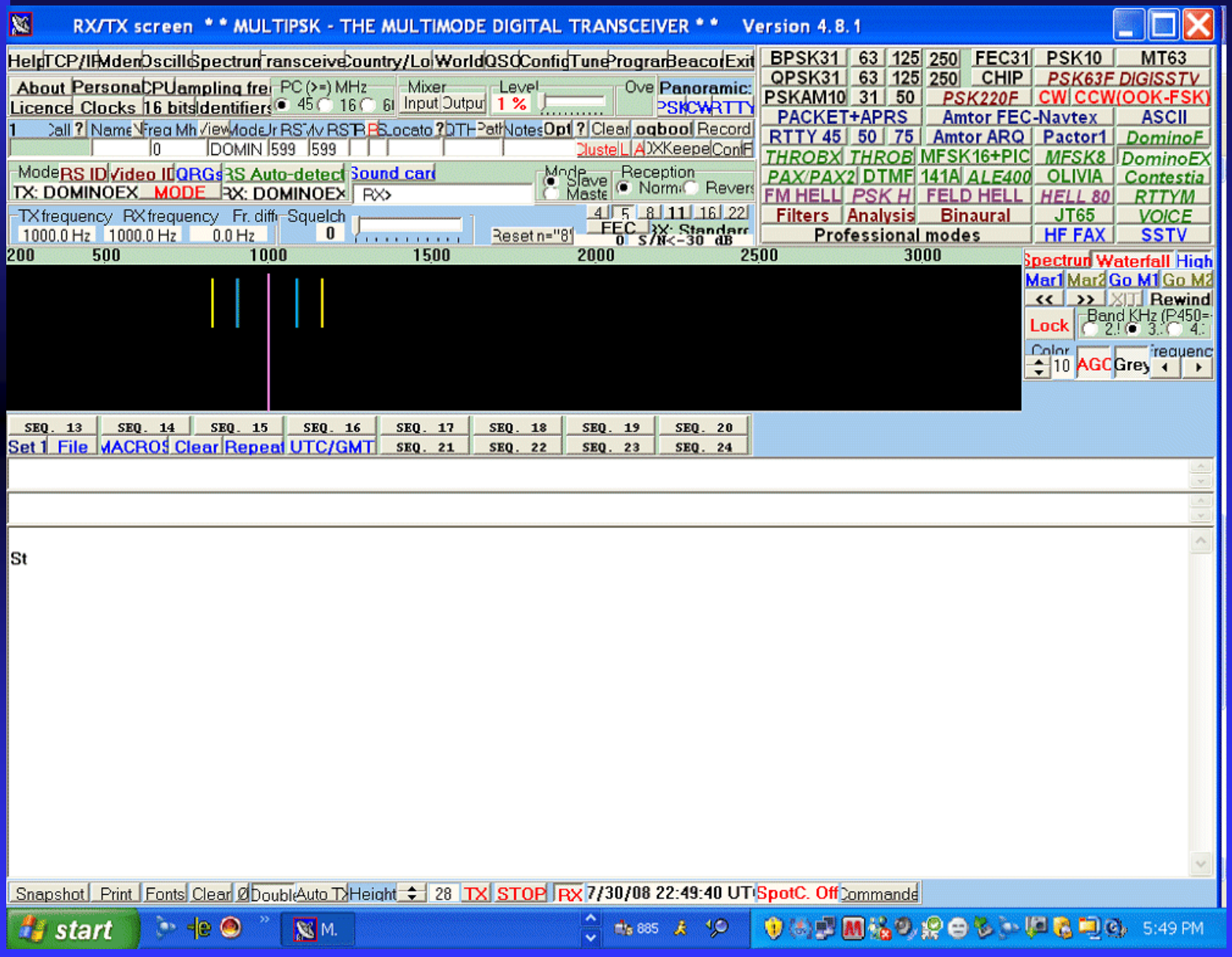
MixW and DTRC are two popular programs

RTTY Mode



MixW and DTRC are two popular programs

DominoEX5 Mode


RX/TX screen * * MULTIPSK - THE MULTIMODE DIGITAL TRANSCEIVER * * Version 4.8.1
Help TCP/IP Modem Oscill Spectrum Transceive Country/Lo World QSO Config Tune Program Beacon Exit
About Personal CPU Licence Clocks 16 bits Identifiers
PC (>=) MHz 45 16 6
Mixer Input Output
Level 1 %
Panoramic:
Mode RS ID Video ID QRG RS Auto-detect Sound card
TX: DOMINOEX MODE RX: DOMINOEX
Reception Normal Reverse
TX frequency RX frequency Fr. diff Squelch
1000.0 Hz 1000.0 Hz 0.0 Hz 0
BPSK31 63 125 250 FEC31 PSK10 MT63
QPSK31 63 125 250 CHIP PSK63F DIGISSTV
PSKAM10 31 50 PSK220F CW CCW(OOK-FSK)
PACKET+APRS Amtor FEC-Navtex ASCII
RTTY 45 50 75 Amtor ARQ Pactor1 DominoF
THROBX THROB MFSK16+PIC MFSK8 DominoEX
PAX/PAX2 DTMF 141A ALE400 OLIVIA Contestia
FM HELL PSK H FELD HELL HELL 80 RTTYM
Filters Analysis Binaural JT65 VOICE
Professional modes HF FAX SSTV
200 500 1000 1500 2000 2500 3000
Spectrum Waterfall High
Mar1 Mar2 Go M1 Go M2
Rewind
Lock
Band KHz (P450=
Color 10 AGC Grey
SEQ. 13 SEQ. 14 SEQ. 15 SEQ. 16 SEQ. 17 SEQ. 18 SEQ. 19 SEQ. 20
Set 1 File MACROS Clear Repeat UTC/GMT SEQ. 21 SEQ. 22 SEQ. 23 SEQ. 24
Snapshot Print Fonts Clear Double Auto TX Height 28 TX STOP RX 7/30/08 22:49:40 UT SpotC. Off Commande
start
5:49 PM

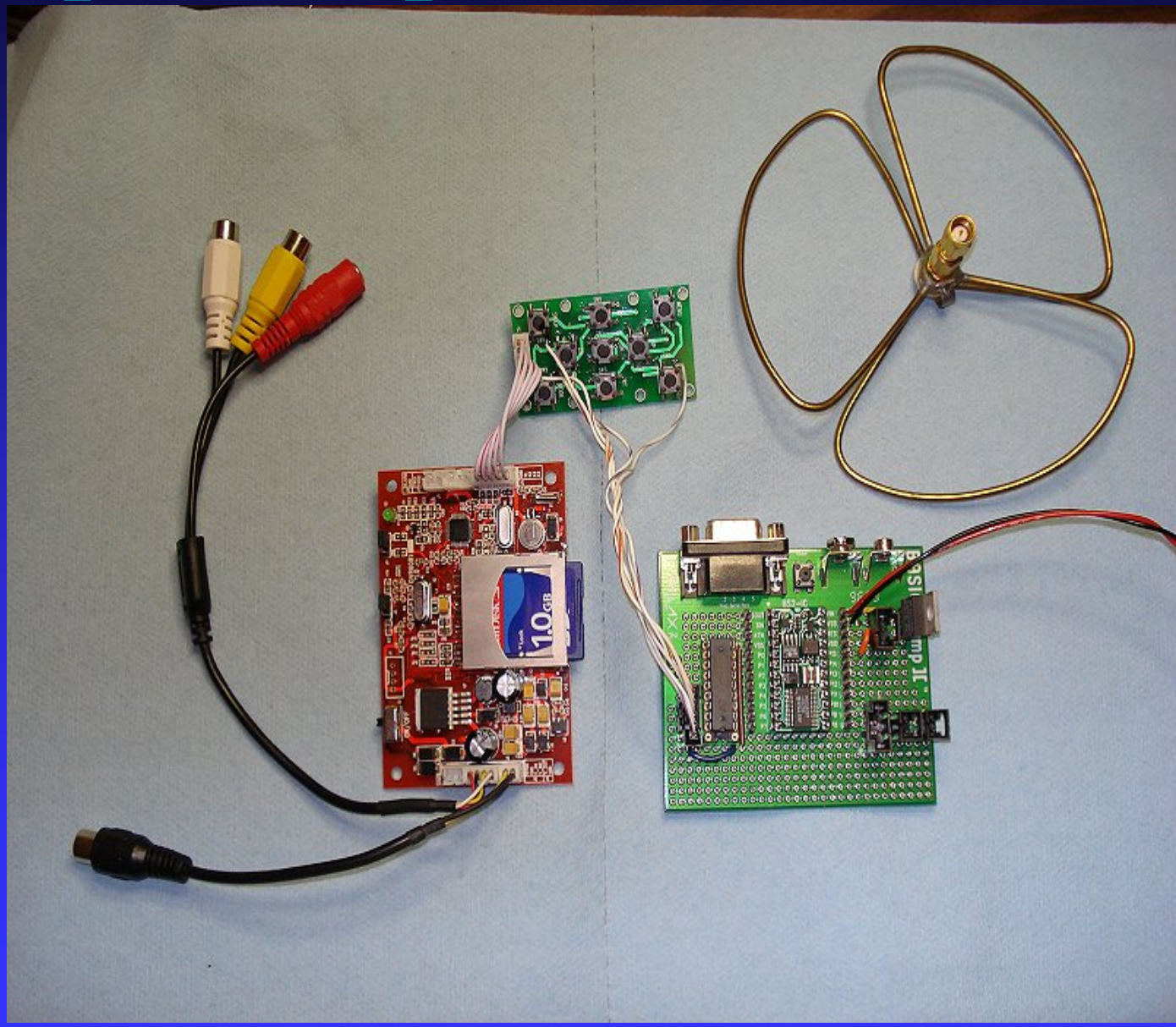
MFSK 18 tones – very weak signal

ATV Simplex Repeater

DVR 8100
Electronics123.com

- 10 sec video clips
- stores on SD card
- 5 fps video

Keypad interface operated by Basic Stamp



ATV Simplex Repeater

C6810
Image recording module with UART interface

Introduction

This module has been designed for serial communication. It allows user to control and retrieve the image data from the module remotely by using UART interface.

Features

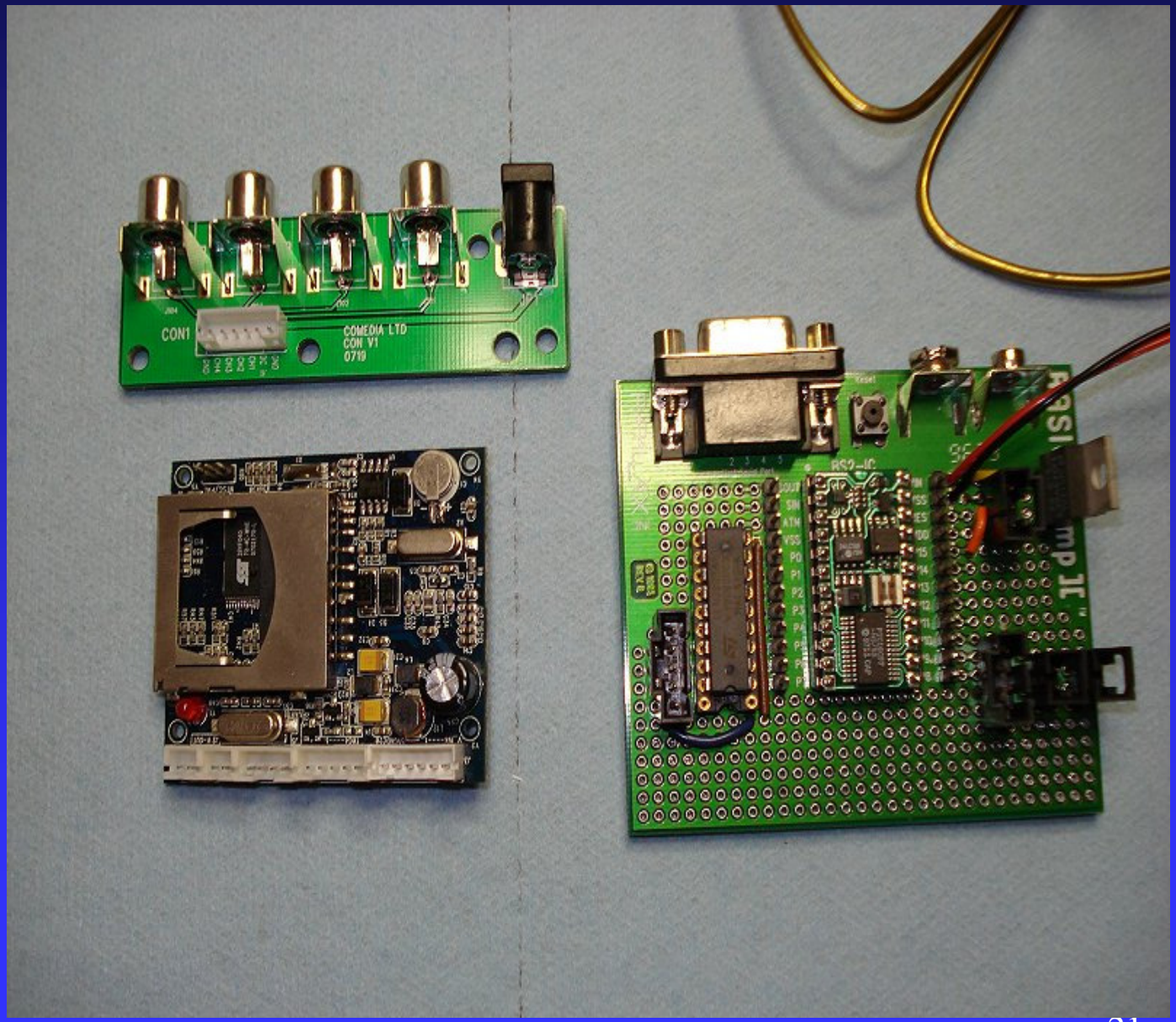
- Allow 4 channels AV input
- Manual capture or by Motion detect
- JPEG /AVI
- UART command control and image data transmission
- Accept external trigger input, 4 ch
- Alarm output when MD
- On board SD card socket (option)
- Detail command list provided
- 5V operation

ATV Simplex Repeater

C6810 DVR
Electronics123.com

- 4 channel input
- 99 sec video clips
- stores on SD card
- 15 fps video

- Controlled by serial interface from Basic Stamp



Serial Output TV camera - SSTV

Search Results - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.electronics123.com/s.nl;jsessionid=0a0107431f431101ca58ab6a4a8d9e438306b3e263c2.e3eTaxiPc3mTe34Pa38Ta38TbNn0?sc=14&category=&search=c328

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C328R-3620BW JPEG Compression VGA Camera Module

The C328 JPEG compression module performs as a video camera or a JPEG compressed still camera. Users can send out a snapshot command from the host in order to capture a full resolution single-frame still picture (OV76xx sensor). The picture is then compressed by the JPEG engine (OV528) and transferred to the host.

Features:
- Low-cost, & low-powered solution for high resolution image capture.
- Built-in down-sampling, clamping and windowing circuits for VGA/CIF/SIF/QCIF/160x128/80x64 image resolutions.
- RS-232: 115.2K bps for transferring JPEG still pictures or 160x128 preview @8bpp with 0.75~6 fps - JPEG CODEC with variable quality settings for different resolutions
- Built-in color conversion circuits for 4 gray/16 gray/256 gray/12-bit RGB/16-bit RGB/Pallet 256 RGB preview images.

Lens included on camera:
F/No 2.0
focal lenght (mm)= 3.6mm
FOV = 50 deg diagonal
IR cut filter : None
Total height from PCB H (mm): 22mm
Diameter of lens cap D (mm): 14mm

(The C328 camera is also available with other lenses)
RoHS Compliant: No

(C328R-3620BW replaced item# C328-3720BW)

Quantity	Price
1 – 9	$47.45

Internet

start C328Camera Search Results - Micr... ATVforum2008_ELK - ... 1:23 AM

Long Duration Balloons

Polyethylene Zero Pressure

- If vented, can stay aloft at float altitude for several days with ballast drop each night

- Expensive to buy

- Difficult to make

Long Duration Balloons

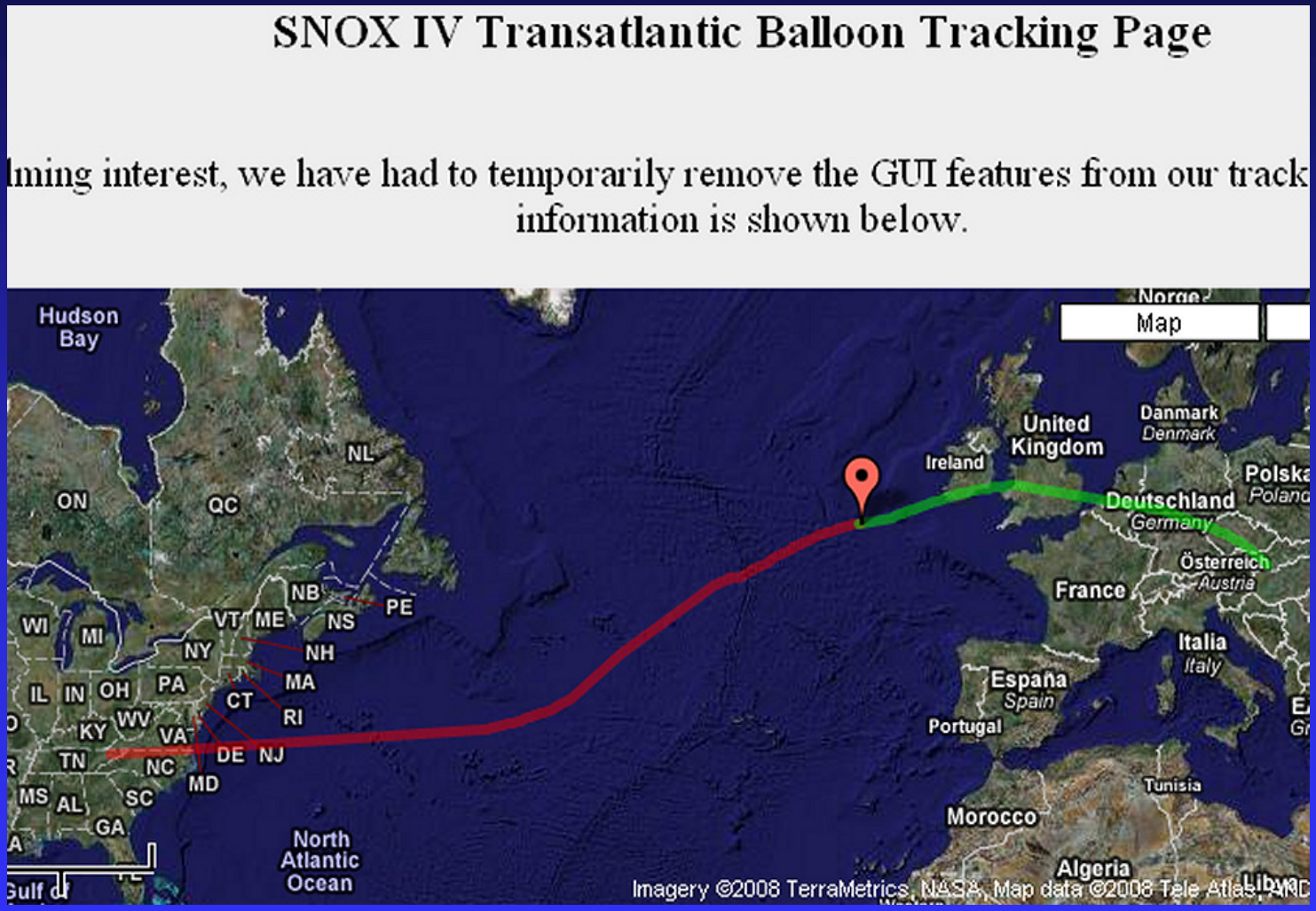
Cylinder Balloon (helium or hydrogen filled)

- Vent at bottom, can stay aloft several days with ballast drop each night

- Relatively easy to make with a heat sealer

WB8ELK launch of ES-OS cylinder balloon built by NG0X

Long Duration Balloons



UTARC Spirit of Knoxville Trans-Atlantic Flight attempt

Solar Balloons

– only Hot Air (one day flight)

KC8UCH

http://mail.gpacademy.org/~rochter/

-Can be assembled with Scotch Tape

- Inflated with a fan

-Sun does the rest

-Can stay at float altitude all day long until sunset

- Tetroon only takes 3 seams and approximates a sphere

Solar Tetroon and Cylinder

http://www.solar-balloons.com

Long Duration floater flights

LATEX Floaters

-Vent valve in balloon neck

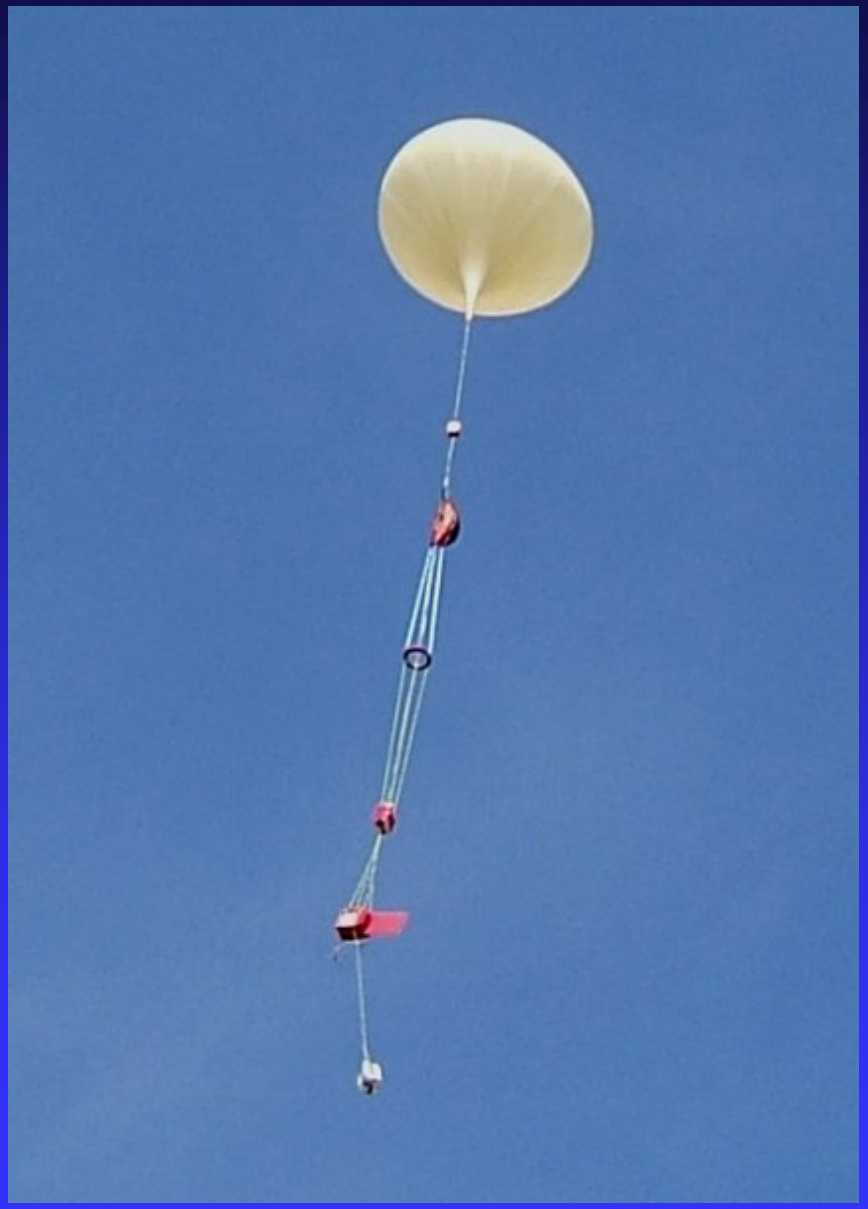
-Ballast drop

- Several hours to 20+ hrs

- UV degradation of latex will limit time aloft when sunlit

-Low-tech idea proven out by Dr. Jean Laby:

(tie string to top of balloon to lift ping-pong style valve in balloon neck)



Long Duration floater flights

-No vent valve

-No ballast

-20 plus hour flights

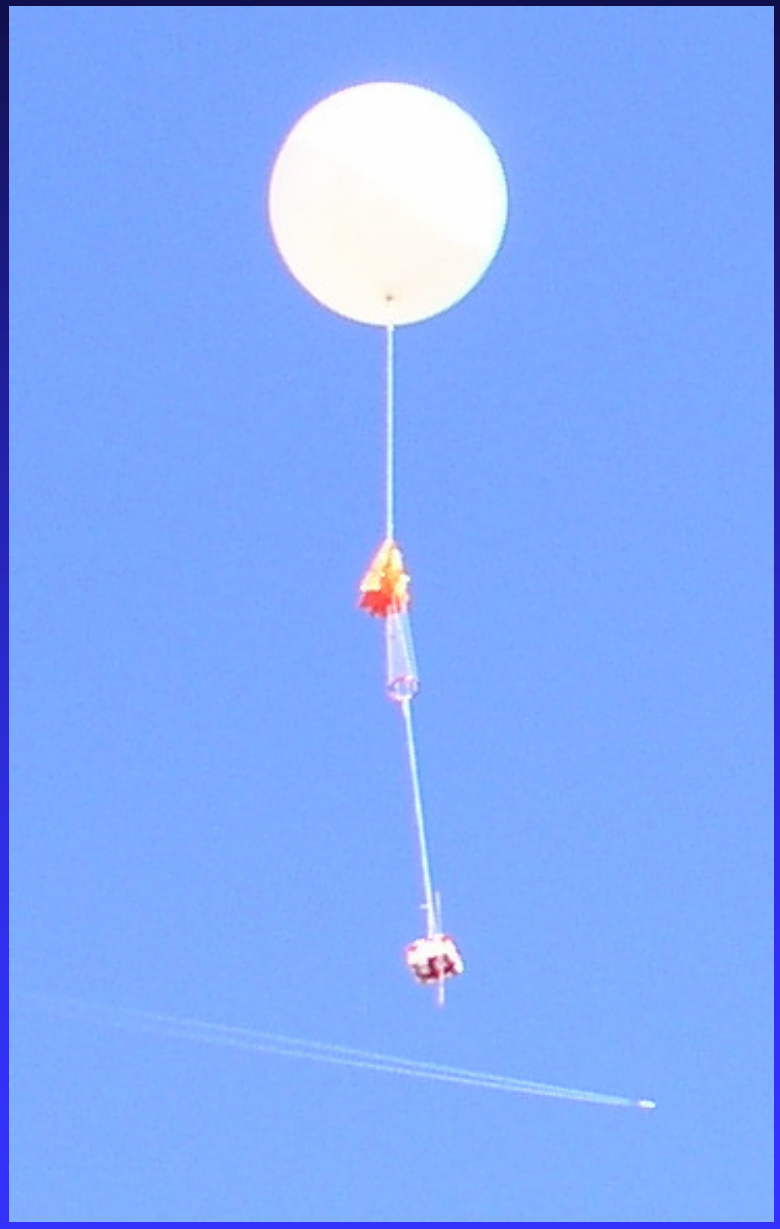
-Standard latex balloons

-Low free lift

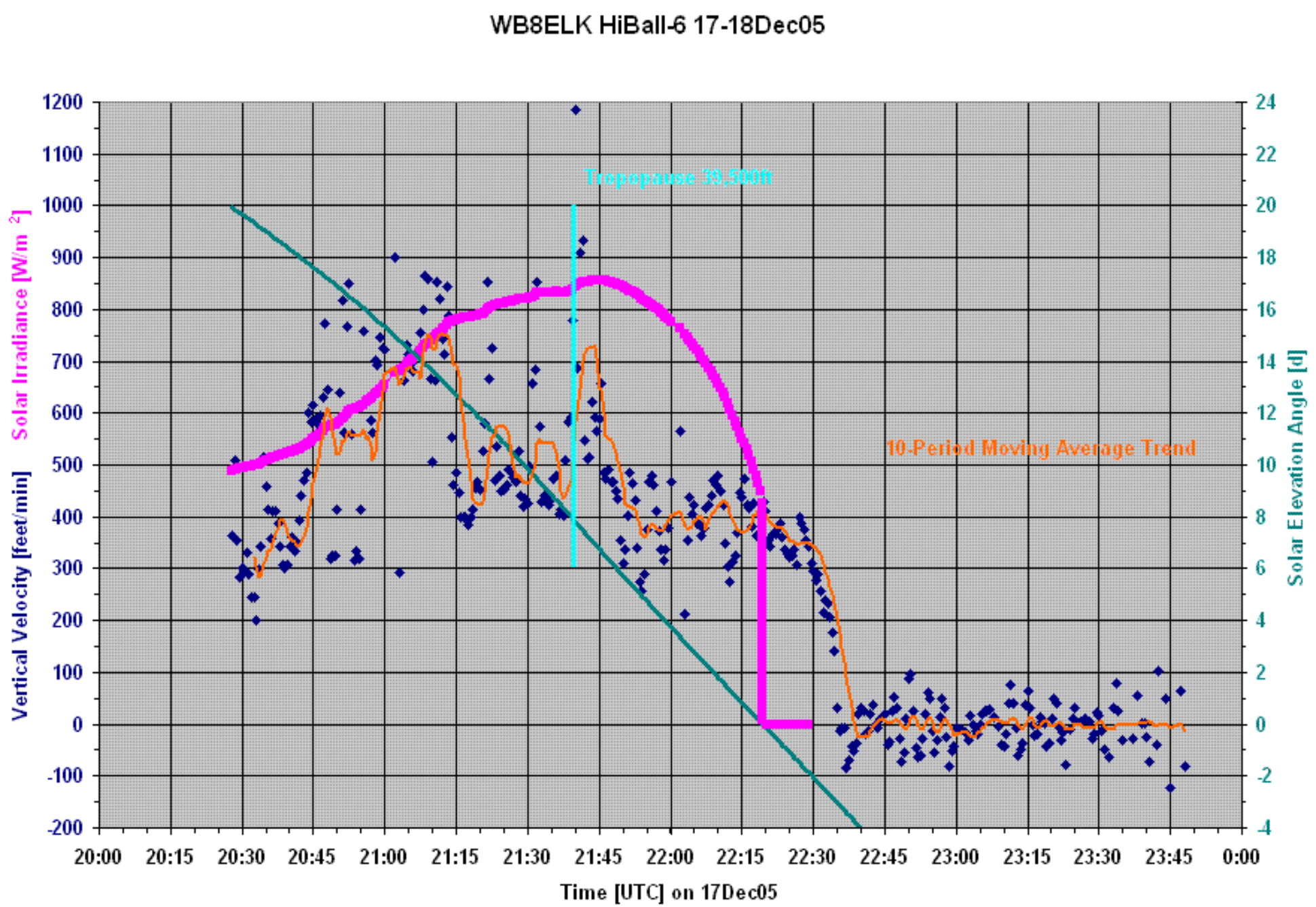
-Released a few hours before sunset

-Ascent stops at balloon sunset

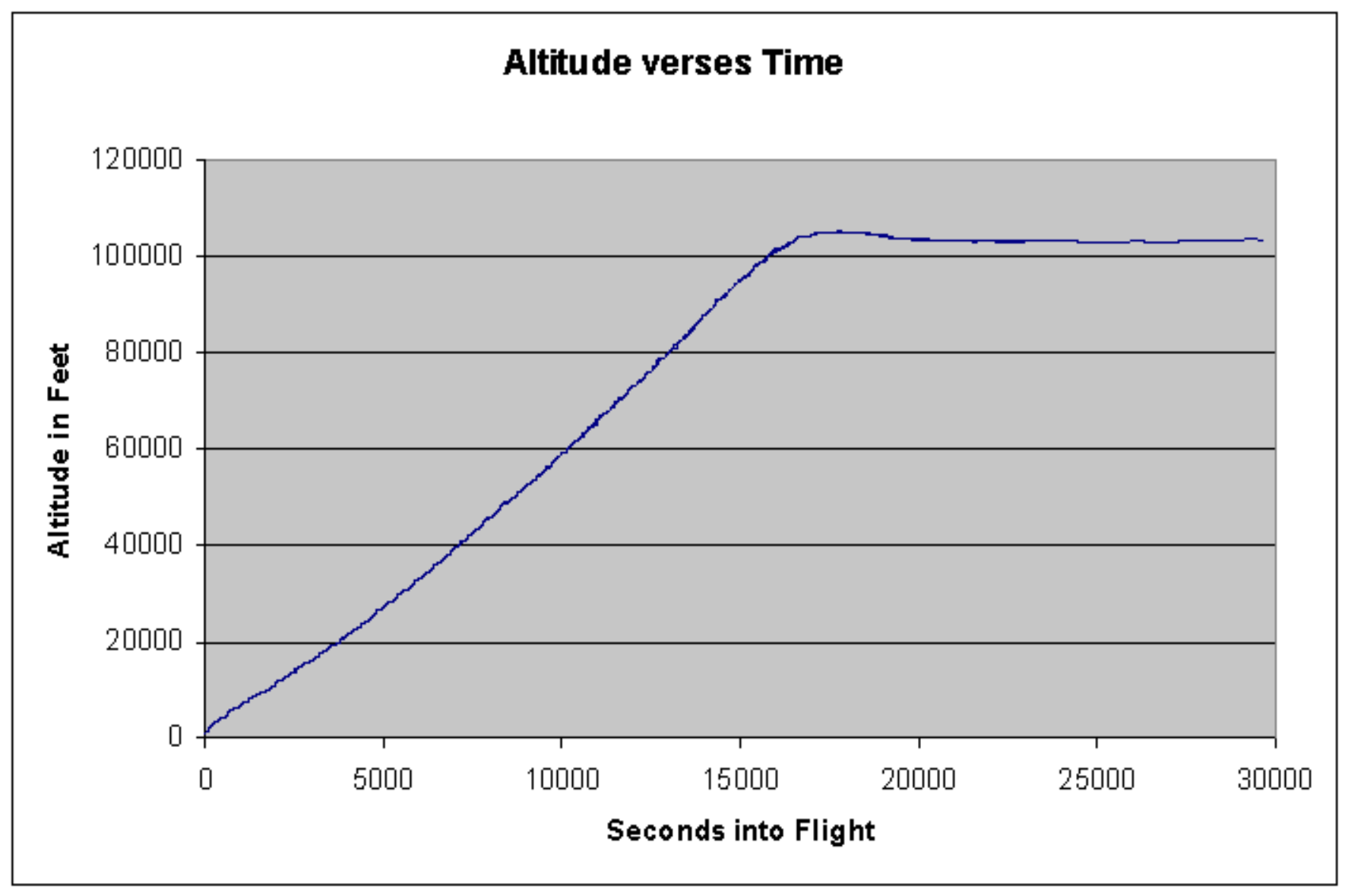
HiBall Launch Video



Solar Irradiance vs. Ascent Rate



Ascent Stops at Sunset



Launched from Huntsville, AL
1400 miles downrange in 20 hours

Green = Daytime portion Violet = Nighttime portion

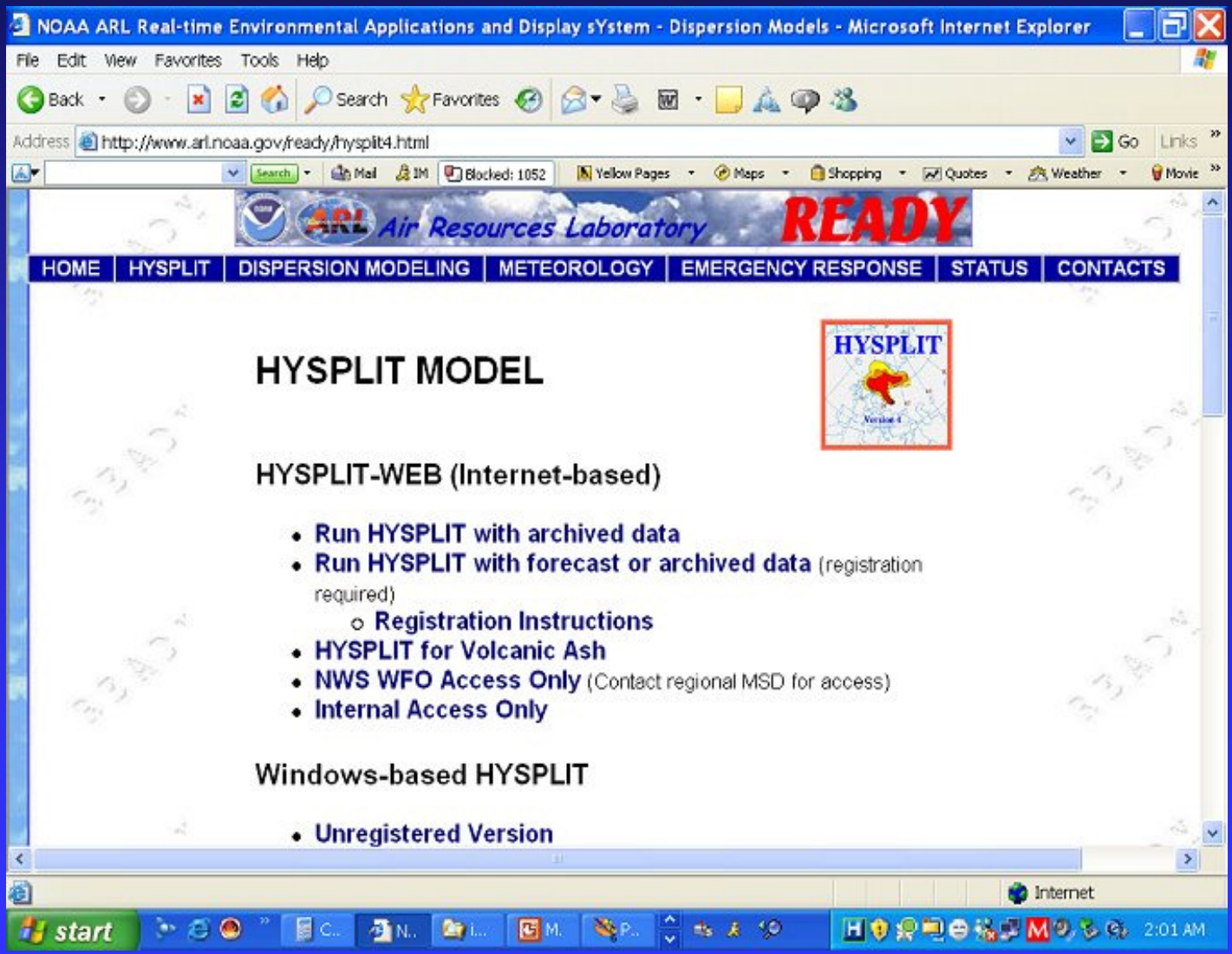
Long Duration floater flights

Using READY HYSPLIT to predict flight paths for multi-day missions

- Registration required by FAXing in request on your group's letterhead

- Once registered, can do long range forecasts at various float altitudes

- Can run archived data without registration

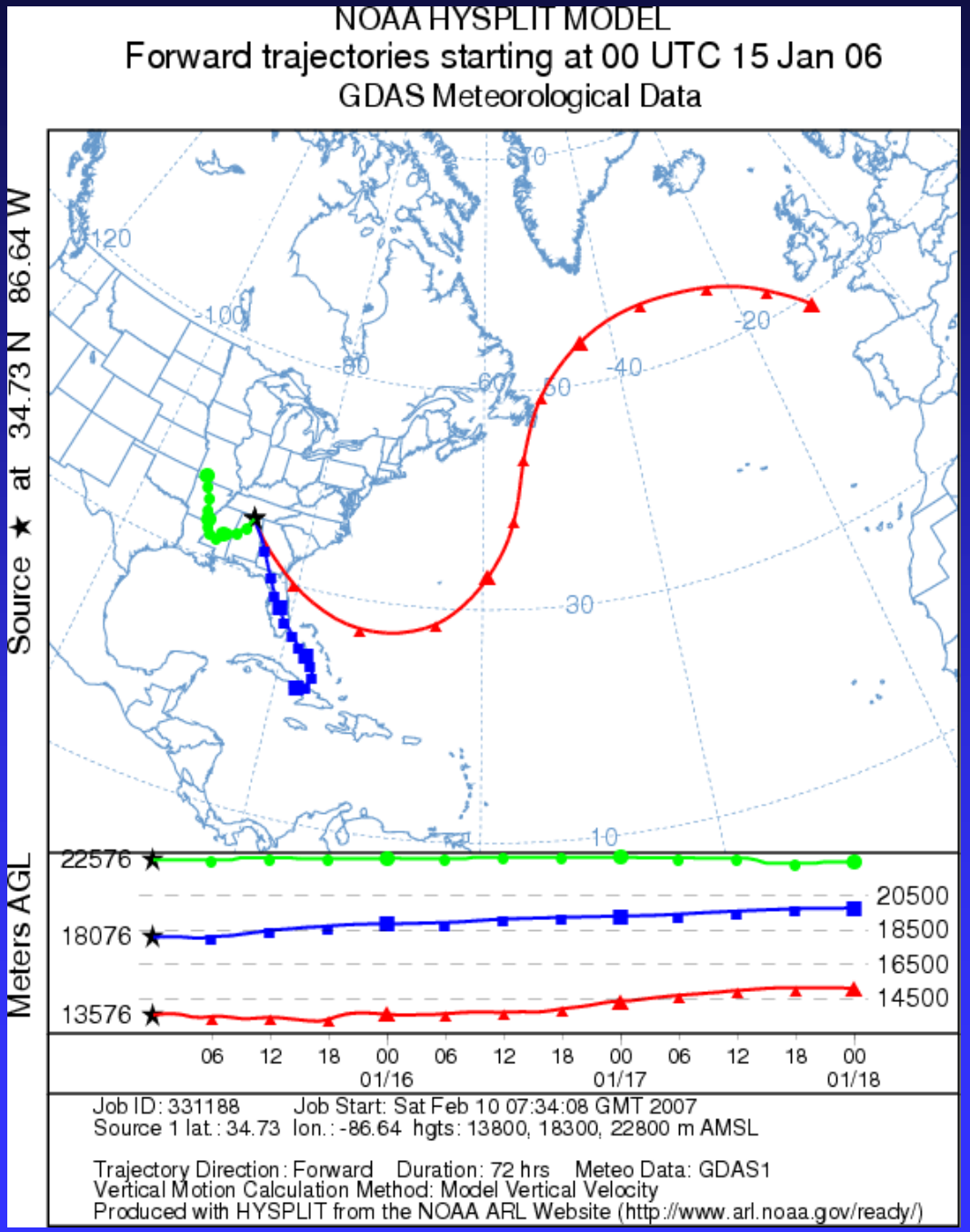

NOAA ARL Real-time Environmental Applications and Display sYstem - Dispersion Models - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://www.arl.noaa.gov/ready/hysplit4.html
Go Links
Air Resources Laboratory READY
HOME HYSPLIT DISPERSION MODELING METEOROLOGY EMERGENCY RESPONSE STATUS CONTACTS
HYSPLIT MODEL
HYSPLIT
HYSPLIT-WEB (Internet-based)
Run HYSPLIT with archived data
Run HYSPLIT with forecast or archived data (registration required)
Registration Instructions
HYSPLIT for Volcanic Ash
NWS WFO Access Only (Contact regional MSD for access)
Internal Access Only
Windows-based HYSPLIT
Unregistered Version
Internet
start
2:01 AM

Long Duration floater flights

JANUARY Flight Paths
(72 hours aloft)

Float altitudes:

Red – 45,000 feet
Blue – 60,000 feet
Green – 75,000 feet

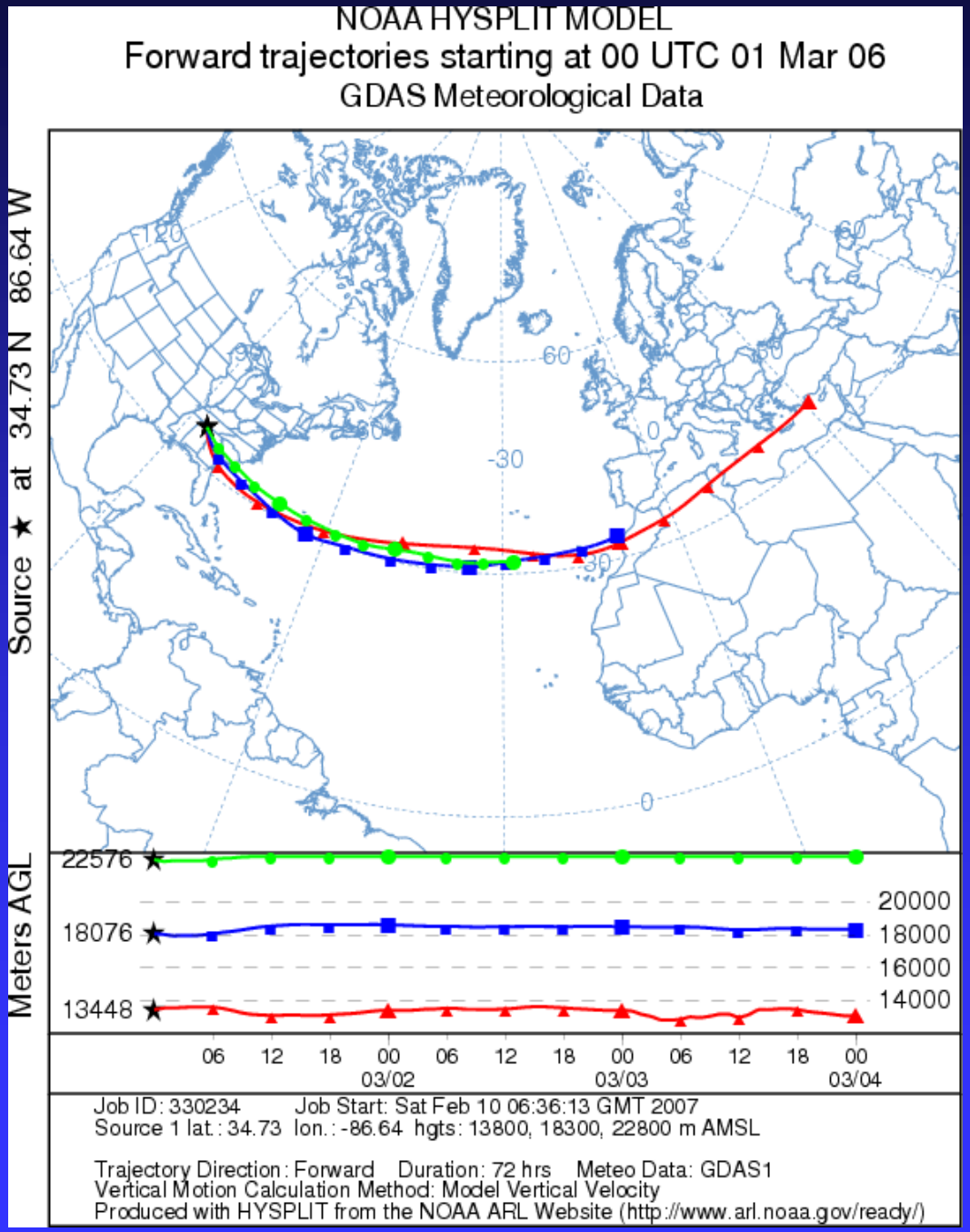

NOAA HYSPLIT MODEL
Forward trajectories starting at 00 UTC 15 Jan 06
GDAS Meteorological Data
Source ★ at 34.73 N 86.64 W
Meters AGL
22576
18076
13576
20500
18500
16500
14500
06 12 18 00 06 12 18 00 06 12 18 00
01/16 01/17 01/18
Job ID: 331188 Job Start: Sat Feb 10 07:34:08 GMT 2007
Source 1 lat.: 34.73 lon.: -86.64 hgts: 13800, 18300, 22800 m AMSL
Trajectory Direction: Forward Duration: 72 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

Long Duration floater flights

MARCH Flight Paths
(72 hours aloft)

Float altitudes:

Red – 45,000 feet
Blue – 60,000 feet
Green – 75,000 feet


NOAA HYSPLIT MODEL
Forward trajectories starting at 00 UTC 01 Mar 06
GDAS Meteorological Data
Source ★ at 34.73 N 86.64 W
Meters AGL
22576
18076
13448
20000
18000
16000
14000
06 12 18 00 06 12 18 00 06 12 18 00
03/02 03/03 03/04
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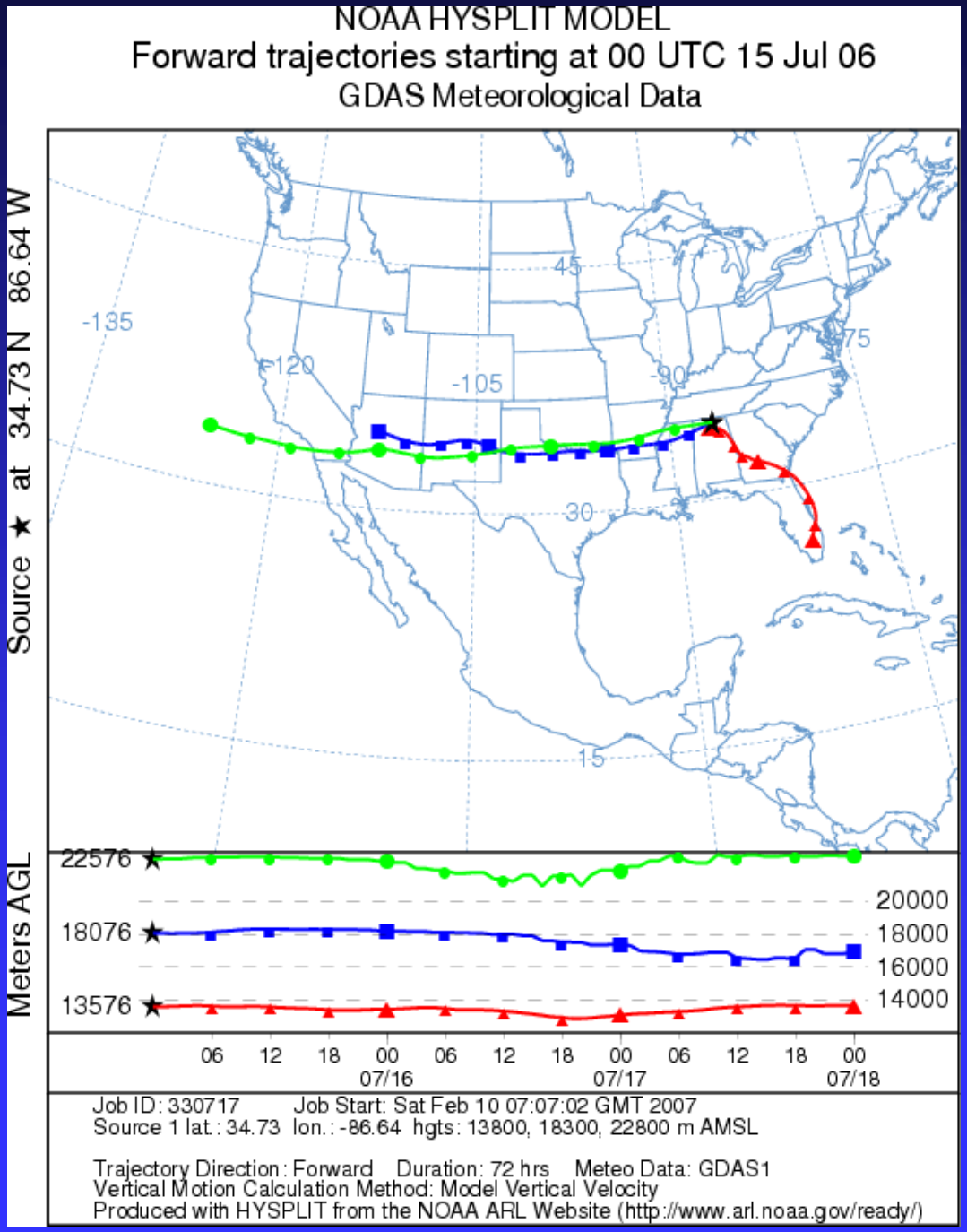
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

Long Duration floater flights

JULY Flight Paths
(72 hours aloft)

Float altitudes:

Red – 45,000 feet
Blue – 60,000 feet
Green – 75,000 feet

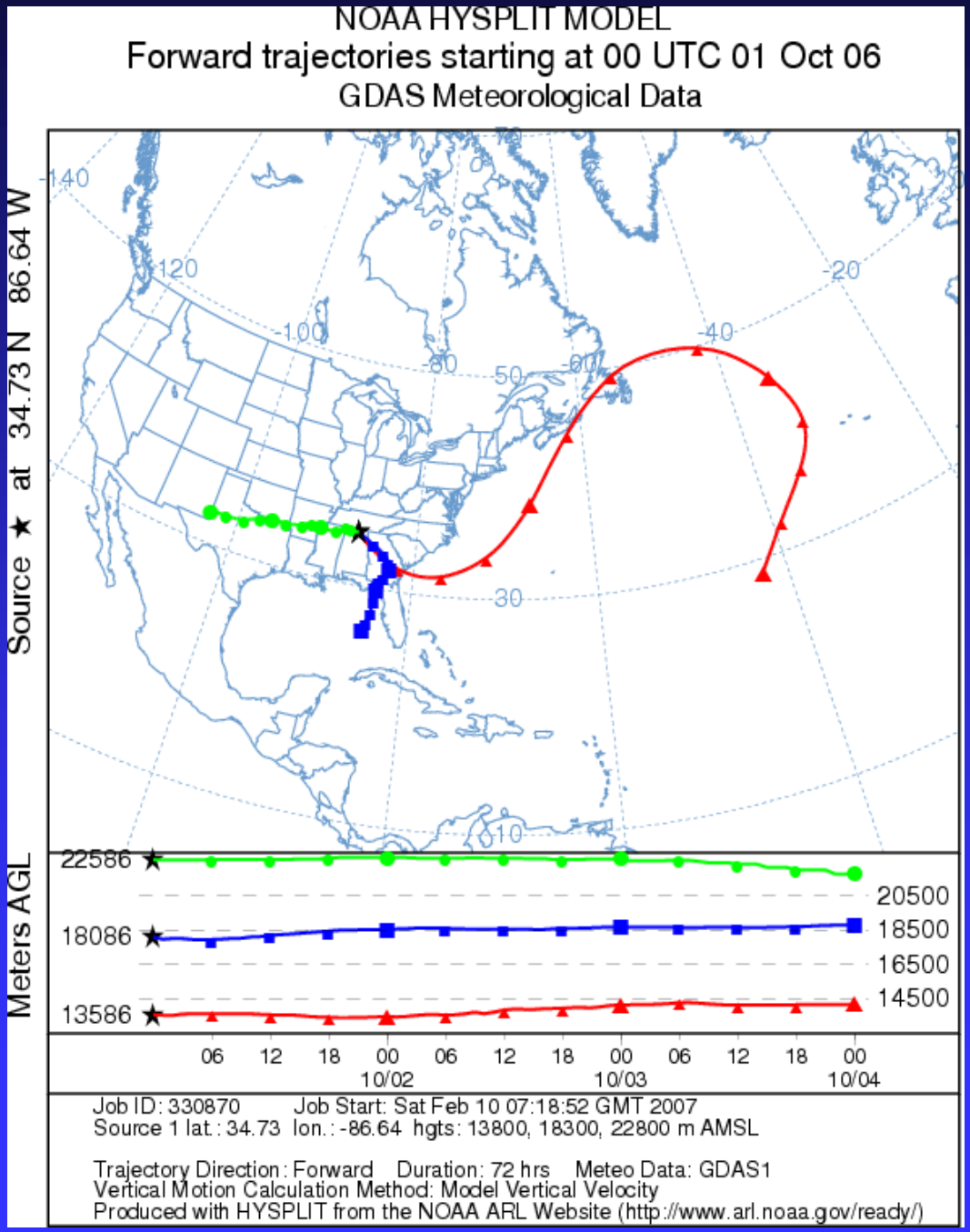


Long Duration floater flights

OCTOBER Flight Paths
(72 hours aloft)

Float altitudes:

Red – 45,000 feet
Blue – 60,000 feet
Green – 75,000 feet

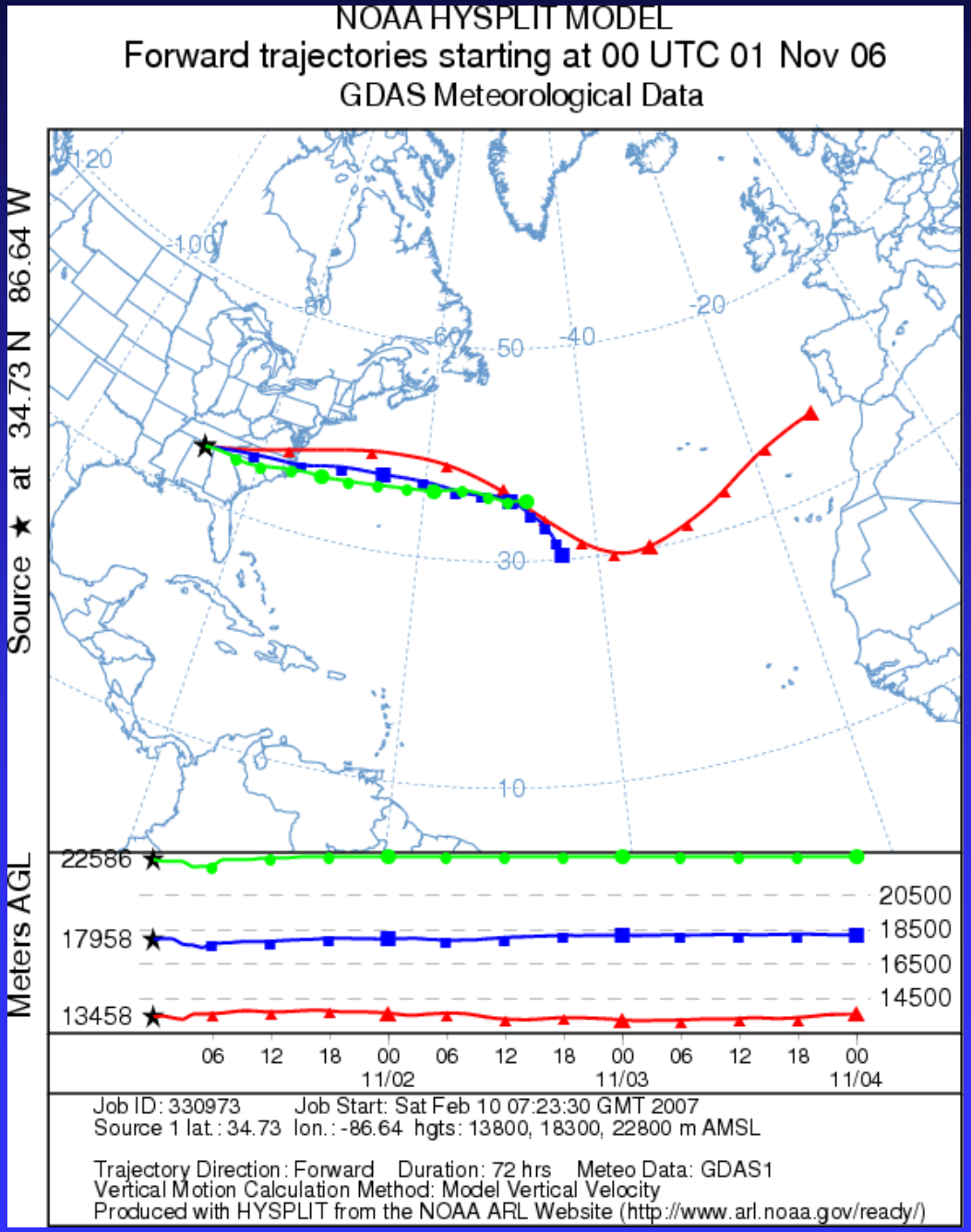

NOAA HYSPLIT MODEL
Forward trajectories starting at 00 UTC 01 Oct 06
GDAS Meteorological Data
Source ★ at 34.73 N 86.64 W
Meters AGL
22586
18086
13586
20500
18500
16500
14500
06 12 18 00 06 12 18 00 06 12 18 00
10/02 10/03 10/04
Job ID: 330870 Job Start: Sat Feb 10 07:18:52 GMT 2007
Source 1 lat.: 34.73 lon.: -86.64 hgts: 13800, 18300, 22800 m AMSL
Trajectory Direction: Forward Duration: 72 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

Long Duration floater flights

NOVEMBER Flight Paths
(72 hours aloft)

Float altitudes:

Red – 45,000 feet
Blue – 60,000 feet
Green – 75,000 feet


NOAA HYSPLIT MODEL
Forward trajectories starting at 00 UTC 01 Nov 06
GDAS Meteorological Data
Source ★ at 34.73 N 86.64 W
Meters AGL
22586
17958
13458
20500
18500
16500
14500
06 12 18 00 06 12 18 00 06 12 18 00
11/02 11/03 11/04
Job ID: 330973 Job Start: Sat Feb 10 07:23:30 GMT 2007
Source 1 lat.: 34.73 lon.: -86.64 hgts: 13800, 18300, 22800 m AMSL
Trajectory Direction: Forward Duration: 72 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

The Future of Balloon Technology?

Launch Video

http://www.wb8elk.com